

# DATAS CONCERNING THE SPHERE OF AGROMETEOROLOGICAL INFORMATIONS OBTAINABLE FROM THE EXAMINATION OF THE STATISTICAL STRUCTURE OF LOCAL TEMPERATURE EXTREMITIES

by

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*Adatok a napi hőmérsékleti szélsőségek hazai statisztikai szerkezetének vizsgálatából nyerhető agrometeorológiai információ kérdéséhez.* A napi szélső hőmérsékletek együttes gyakorisági eloszlása statisztikai szerkezetének meghatározása mellett feladatunknak tekintettük a napi szélső hőmérsékletek statisztikai paramétereinek vizsgálatából nyerhető agrometeorológiai információ feltárását. Az eloszlások áttekintését megkönnyítő kétdimenziós típusnap rendszerezés megalkotásával, a típusnapok havi és évi értékeinek közlésével új klimatológiai jellemzőket kívántunk megismertetni.

A táblázatok és ábrák tartalmának értelmezése és gyakorlati hasznosítása agro- és bioklimatológiai kutatásokban, valamint a korszerű mezőgazdasági gyakorlatban valósulhat meg.

Beside the exploration and determination of the statistical structure of collective distribution of daily temperature extremities it was considered an objective the exploration of agrometeorological information obtainable from the examination of statistical parameters of daily extreme temperatures as well.

It was aimed to acquaint with the readers new climatological informations obtained from the creation of a two-dimensional typeday catalogueing which facilitates the survey of distributions, with the publication of monthly and yearly values of typedays.

The interpretation of the datas appearing on the tables and figures, their application in practice can be realized in agro- and biometeorological researches as well as in a modern agricultural practice.

## Introduction

In more than twenty years no work of importance has dealt with a detailed examination of daily temperature extremities in Hungary. Works concerning the characteristics of the distribution of daily minimum and maximum temperatures were published only recently [1, 2, 3, 4].

Up to now no local or foreign work has dealt yet with the joint observation of the distribution frequency of daily temperature extremities in a two-dimensional statistic field.

The aim of this work examining the local structure of collective distribution frequency was to determine the two-dimensional distribution frequency of the two temperature characteristics, to reveal its statistical structure and to display the— from an agrometeorological point of view utilisable results on tables and diagrams.

With the help of the two-dimensional statistic methods [5] applied in this work hitherto unknown information could be revealed about the collective distribution of above-mentioned closely related two climate factors.

An analysis applying this method, of the element groups of the two temperature characteristics, offers a considerable help and directly utilisable informations especially in agro- and biometeorological researches [6, 7].

On the basis of the results of our researches more exact and ambiguous extreme temperature climate limits and characteristics can be determined, which are necessary to the cultivation of different plants, and to the application of modern agrotechnical processes.

### **The Occurrence of Theme in Hungarian and in Foreign Special Literature**

At the beginning of the fifties *Bacsó* analysed the local distribution of daily temperature extremities, the geographic structure of extreme temperature threshold days [8, 9, 10, 11].

At the beginning of the sixties the frequency distribution of daily maximum and minimum temperatures was discussed by *M. Rákóczi* and *Hajósy* [12, 13].

From the beginning of the seventies a detailed and differently centred analysis has been made of the frequency distribution of daily temperature extremities and that of their difference given by daily temperature oscillations by *Károssy* and *Kiss* [14, 15, 16, 17, 18].

The collective analysis of the different climate factors has recently made its appearance in the Hungarian as well as in the foreign special literature [17, 18, 19, 20, 21, 22, 23].

In the above-quoted works with the collective statistical analysis of closely related climate elements, the intricate, interrelating system of relationships of hitherto independently, separately treated climate factors can be exposed.

### **Analytical Methods and Datas**

The definitions, functions and formulas applied for two-dimensional conditional distributions were utilised [5] in the course of the analysis.

To reveal the statistical structure of daily temperature extremities, the daily maximum and minimum temperature datas of sixty years, observed by eight Hungarian meteorological stations (Mosonmagyaróvár, Keszthely, Pécs, Budapest, Kálcsa, Kecskemét, Szeged and Debrecen) were utilised, during the period of 1901—1960/64.

Calculations necessary to this work were completed by a computer type R 40 which is in the possession of JATE (József Attila University of Sciences and Arts) with a suitable transformation and replay of program OSIRIS III. Datas were obtained by copying the datas recorded on magnetic tapes of the Meteorological Office.

With the obtained datas the monthly and yearly contingency charts could be drawn representing the collective frequency distribution with 1° temperature intervals.

With the help of contingency charts the figures of the two-dimensional frequency distribution fields pertinent to the above-mentioned stations can be drawn (*Figures 1—13*).

From the empiric frequency distributions the relative frequencies, of the days given by a new, uniform codifying method introduced on *Figure 14*, of the occurrence of extreme temperature threshold days pertinent to the given values, as well as the place and time factors of daily temperature oscillations could be determined (*Tables 1—19*).

To the analysis of the collective frequencies of extreme temperature threshold days pertinent to given temperatures the above-mentioned standardization and designation system was elaborated.

From the frequencies of two-dimensional collective distributions the statistical parameters of the two temperature characteristics as well as the values of obliquity and distortion, signifying third and fourth degree momentums, were determined. The normality analysis of the empirical limit distributions was completed by the  $\chi^2$  proving method. It was tried to simplify the normality analysis of the distributional surface with the help of different fluctuation parameters obtainable from the collective distributional fields.

With the yearly and monthly regression straights of the two temperature characteristics as well as with the analysis of the correlating coefficients the change of the joint conditions of the two, closely related climatic elements, and the nature of their stochastic relation were observed [24].

To analyse the connection between the two temperature characteristics and the meteorological positions the data were classified according to the respective days being shiny, cloudy, windy or calm during the 1964—73 ten year long period in Szeged as well as these data were examined on the basis of collective frequencies grouped according to the large scale weather situations with the *Péczeley* method [14, 15, 24].

### Evaluation of Analytical Results

It can be stated from an examination of the frequency fields of collective empirical frequency distributions of the daily temperature extremities that the collective frequency fields occupy according to the yearly temperature proceeding different areas of the expounded distribution field. The inner bodies of the distribution fields of greater relative incidence with the displacement of the whole distribution field are shifted into different temperature territories. During the winter months along the  $y=x$  straight as an axis the distribution fields are more elongated and they concentrate with greater incidence values. The maximal densities with an occurrence of 1,5 and 2,0% collective frequencies are found more or less in the same temperature territories. This means that during the winter months in the different areas of our country approximately the same incidence of collective distribution of daily extreme temperatures can be expected to occur in the same temperature territories. During the spring, summer and autumn months the inner probability fields of collective incidences with greater relative occurrence are manifold cut, they shift into a different temperature interval at a different meteorological station. This is first of all the characteristic of the summer and early autumn periods. This means, that in our country there are significant differences in the daily extreme temperature values, and it is especially apparent in the probability fields of less than 5% relative incidence values. These extreme temperature differences of collective (frequencies) occurrence frequency values must be considered in the meteorological practice especially in the cultivation of plants which are sensitive to daily temperature extremities. Above-stated facts are underlined by the fact that the absolute probability territories of collective distribution fields greatly differ according to month as well as station. There are significant differences during the summer, autumn and especially spring months. The differences of distribution fields can be explained with the great dispersion of the daily temperature extremities, and with a significant extension of these dispersions during the year (summer). The greatest dispersions experienced during the summer months most probable are due to the greater radiation and consequently greater irradiation of the summer which are decisive factors in forming the daily temperature extremities [17]. Because of the density of data above-mentioned great differences are less shown on the yearly distribution fields of collective frequency distribution of daily temperature

extremities, the differences in the form and moduses of distribution fields refer however to the moderating effect of Atlantic climate which is more prevalent in the North-West part of the country, to the daily temperature extremities. The stronger predominance of Continental climate effects on the Great Hungarian Plain is displayed with the greater largeness of the yearly distribution fields and their displacement into the direction of more extreme temperature territories.

The above-mentioned characteristics of collective distribution of daily temperature extremities are, first of all, apparent in given temperature conditions, with the declaration and examination of the number of threshold days which can be utilised in agrometeorological and bioclimatological researches as well as in the agricultural producing process. Instead of the extreme temperature threshold day standardization prevalent in the climatological practice, an improved variation, a uniform two-dimensional temperature standardization developed and suggested (*Fig. 14*) here makes possible the grouping into given temperature territories of the collective incidence of the daily maximum and minimum temperatures occurring in any climatic territory so that the data are grouped according to daily temperature oscillations as well. The here suggested logical system of designations and denominations of the two-dimensional extreme temperature standard days are in complete consistency with the earlier prevalent threshold day standardization, though it was in many ways wanting and contradictory, which shortcomings are eliminated now.

The structure of the two-dimensional threshold day standardization introduced on figure 14 is explained as follows: To design daily maximum and minimum temperatures to superior to 0 °C capitals, those inferior to 0 °C the small letters were introduced. At the application of letters the one designating the daily maximum temperature was placed first at all times. The letters codifying daily maximum and minimum temperatures with 10 °C intervals are distributed on both axes in a positive and negative direction from the origin with 10 °C spaces inbetween. In this way a codifying system determined by two letters is obtained which groups the aboveintroduced density intervals of the two-dimensional extreme temperature statistic field with combination of the successive letters and capitals of the alphabet.

The codifying method introduced on figure 14 gives the standardization of collective frequency of daily temperature extremities in this country. A consequent expanding of the now introduced system of codification makes possible the two-dimensional grouping of daily temperature extremities occurring on any climatic territory of the Earth.

An earlier standardization of extreme temperature threshold days made possible a more detailed (5 °C) grouping (e.g. summer day, heat day) in certain temperature intervals (25 °C, 35 °C). In order to ensure a more detailed grouping in the codifying system an upper and lower comma were introduced to designate the 5 °C threshold values within the 10 °C intervals while applying at the same time the letter for the 10 °C interval of a given variable. This means that the maximum temperatures belonging to the 25 °C and 30 °C interval are designated according to the 10 °C distribution "C" and an upper comma. Consequently a day with a maximum temperature of 26 °C and a minimum temperature of 7 °C is designated "C' A".

On *Table 1* the collective two-dimensional frequencies of yearly average values of the analysed meteorological stations are displayed grouped according to above-mentioned coding types. The heading of the charts represent the examined stations (Mosonmagyaróvár, Keszthely, Pécs, Budapest, Kalocsa, Kecskemét, Szeged, Debrecen). There are significant differences in the yearly average occurrence of the dif-

ferent collective extreme temperature types at the various stations. Differences can be as great as 20—30% average.

The standardization introduced on *Fig.14* and *Table 1* can be improved by taking into account the measure of daily temperature changes. If the daily temperature oscillations are distributed into three groups (I — temperature oscillation)  $I < 5^\circ =$  small daily temperature oscillation,  $5^\circ < I < 15^\circ$  (medium daily temperature oscillation)  $I > 15^\circ$  (great daily temperature oscillation), these temperature oscillation categories cut parallel fields with the  $y=x$  straight as an axis. In this way the yearly collective extreme temperature threshold day types given on *Tables 2—4* and grouped according to daily temperature oscillation categories are obtained, as well as the values of collective, two-dimensional threshold day types pertinent to the various stations, which values are grouped on *Tables 5—16* with daily, monthly oscillations.

The values on the charts of two-dimensional extreme temperature frequencies are expressed in days which show the local distribution of extreme temperature collective statistical structure. The predominance of Continental effects on the Great Hungarian Plain can be observed from the low values of small daily temperature oscillations at Kecskemét and Debrecen (68,16 and 38,00 days), while the Atlantic climatic effect is more predominant at Mosonmagyaróvár (91,03 days). On the other hand, the number of days with great temperature oscillation is the highest on the Great Hungarian Plain (Kecskemét 47,29 and Debrecen 89,60 days), while the average values were 12,73 at Keszthely and 20,00 at Kalocsa.

The average yearly values grouped according to the two-dimensional extreme values threshold day temperature oscillations significantly differ from each other in every type at the various stations. The difference between some frequencies can be in case of a few types one or twofold only, in the case of most types three or four times as much and in many cases there can be a tenfold difference even (*Tables 2, 3, 4*).

The average values of monthly collective two-dimensional threshold day types appearing on *Tables 5—16* show the following main characteristics: During the winter months maximal values occur at small temperature oscillation in types "aa", "Aa" and "AA", at medium temperature oscillation days in types "Aa", at great daily temperature oscillations in types "Aa", "Ab" and "Ba". During spring months corresponding to the increasing temperature the collective daily extreme temperature frequencies occur in the greatest number at small oscillation days in types "AA" and "BB", at medium oscillation days at types "BA" and "CB", at great oscillation days in types "Ba", "BA", "Ca". and "CA". During the summer months the greatest frequencies can be found during days with small temperature oscillation in types "BB", during days with medium oscillation in types "CB" and "CB", during days with great temperature oscillation in types "C'B". During winter months corresponding to the decreasing daily temperature the types characterising spring months occur with maximal values.

The monthly average days of the examined stations, corresponding to the daily extreme temperatures of small, medium and great temperature oscillations are shown on *Tables 17, 18* and *19*. The figures and the tables make apparent that the frequency of days with small temperature oscillations is highest during the winter months. At Budapest, Keszthely and Mosonmagyaróvár more than half of the month's days belong to this type. Significantly less such days occur at Kalocsa and in Debrecen (11,78 and 11,42 days). During the spring and the summer months the average number of days with small temperature oscillation significantly decreases. During July and August there are 0,22 such days in Debrecen and 0,40 at Kecskemét. The maximal incidence of days with medium temperature oscillation vary from station to station dur-

ing the spring months (March, May) in July in Budapest; it appears with values from 23—26 days. The maximal incidence of days with great temperature oscillation appears during the summer months. In July with an average of 13,85 days at Debrecen and with 4,14 days at Keszthely in August (*Tables 17—19*).

Grouping the daily extreme temperatures of the examined stations according to the size of oscillations unambiguously shows the previously stated role of Continental and Atlantic effects in the local occurrence of extreme temperatures [15, 24].

Present work does not aim to discuss further information appearing on *Tables 1—19*. With the publication of obtained data it was wished to be able to offer a contribution to a detailed extreme temperature analysis which is becoming more and more important in the agrometeorological and bioclimatological researches as well as some data which can be utilised in the agricultural practice.

It is especially important to apply and to disperse the suggested threshold day standardization, the consideration of informations appearing on the charts in the cultivation of plants which are sensitive to temperature effects. In the case of maize, for example, the occurrence of threshold temperature threshold days of types "BB", "CB" and "CC", in the case of tomatoes and paprika types "CB" and "CC" provide the most favourable agroclimatological condition to the growing and development of these plants [25].

The different classification applied in agrimatology [26] are completed and made more exact [27] by the uniform, two-dimensional standardization and data processing introduced in this work.

From an analysis of further statistical parameters defined to the examination of collective distribution of daily temperature extremes certain statements can be drawn which correspond to previous research results though they elucidate the problem of collective distributions to a greater extent [5].

On the basis of  $\chi^2$  proof applied to the values of density projections of collective distribution fields it can be stated that both monthly and yearly collective distribution fields are best approached with the help of the two-dimensional normal distribution. The one year long collective distribution field, because of the cumulation of values of the winter and summer months, can be described with a combined, two-dimensional normal distribution with two moduses, while the one month long distribution fields can be described with a two-dimensional normal distribution with parameters of monthly varying peak and obliquity. Corresponding to the two-dimensional normal distribution the frequency fields of collective distributions, because of the mutual, from above limited condition of the two temperature characteristics, can theoretically be circumscribed with ellipses expanding in a various degree along the straight  $y=x$  as an axis. The theoretically defined elliptic distribution fields are not filled in with the actual distribution fields — since sixty years is a too short period for a thorough examination of extreme temperatures. In case of longer temperature lines the difference between the two distribution fields would be less apparent. The geometrical regressive straights derived from the absolute values of extreme temperatures and the calculated actual regression straights do not correspond because of the inner distortion of the distribution fields. From the difference between the coefficients of the two regression straights the degree of adherence of the distribution surfaces to the normal distribution surface can be deducted. The quick and simple procedure suggested to examine the normality and adherence of distribution surfaces compares assumedly uniformly distributed theoretic distribution fields and assumedly normally distributed empiric distribution fields so it can be utilised in defining the degree of normality only in an informal way. From the calculations within the scope of this work it can

be concluded that on the basis of the  $\chi^2$  proof there are no significant differences between the normal distribution and the collective extreme temperature distribution fields.

Determination and being aware of the absolute extreme values of the collective distribution fields along with the normality of collective distribution fields make possible to from the outlines of the collective extreme temperature frequency fields without the long and tedious dimensioning of the complete set of datas. Above-mentioned method allows furthermore the extension of parameters determined from a smaller set of datas to a longer period of time at meteorological stations that do not possess longer observation series, as well as an approaching determination of climatologically obtainable collective frequency distributions of the two temperature characteristics and a forming of collective distribution fields with a certain error.

To draw a theoretically determinable distribution field with the above-mentioned method, it would be necessary to supply and to publish parameters  $MAX_{min}$  and  $MIN_{max}$ , that is the yearly and monthly lowest maximum and highest minimum values which have not been used in meteorological publication of data yet.

It can be concluded from the yearly and monthly lines of regression straights showing the degree of mutual condition of the two temperature characteristics that the daily maximum temperatures influence to a greater extent daily minimum temperatures during winter and vice versa, — daily minimum temperatures more strongly determine the maximum temperature of the same day during winter than during summer. During the spring, summer and autumn months the reason for the decreasingly close conditional relation unequivocally shows the effects of radiation factors.

The same observation is reflected by the correlation coefficients which express the closeness of the relation of the two temperature characteristics. The relations which appears positive positive during the whole year, is closer during winter months than during summer.

The decrease of closeness of relation during the summer months on one hand can be explained with the effect of advection factors which play a more significant role during that time and with the fact that the surface radiates to a greater extent as a consequence of a stronger radiation and warming up, on the other hand.

Above statements are underlined with more detailed datas by the statistical parameters of collective frequency distribution of daily temperature extremities examined for ten day long periods. With the help of parameters for periods of ten days the singularities of the line of the two temperature characteristics were demonstrated, which singularities appear only during certain periods [15]. With the determination of singular dates and with the analysis of tis characteristics it was wished to offer informations which can be utilised in agrometeorological forecasts.

With a tangential examination of the relation between the large scale weather situation and the collective daily extreme temperatures it was concluded that anticyclonic situation which cause fair weather (*Ae*, *A* give rise to essentially greater temperature oscillations than cyclonic situations which can be characterised with a cloudy sky (*mCc*, *CMw*), or *AW* anticyclonic situation. The greatest temperature oscillations ( $I > 15^\circ\text{C}$ ) are created by situation *A* and *An* on fair advectional days in October, by situation *As* and *Ae* on days without advection [14].

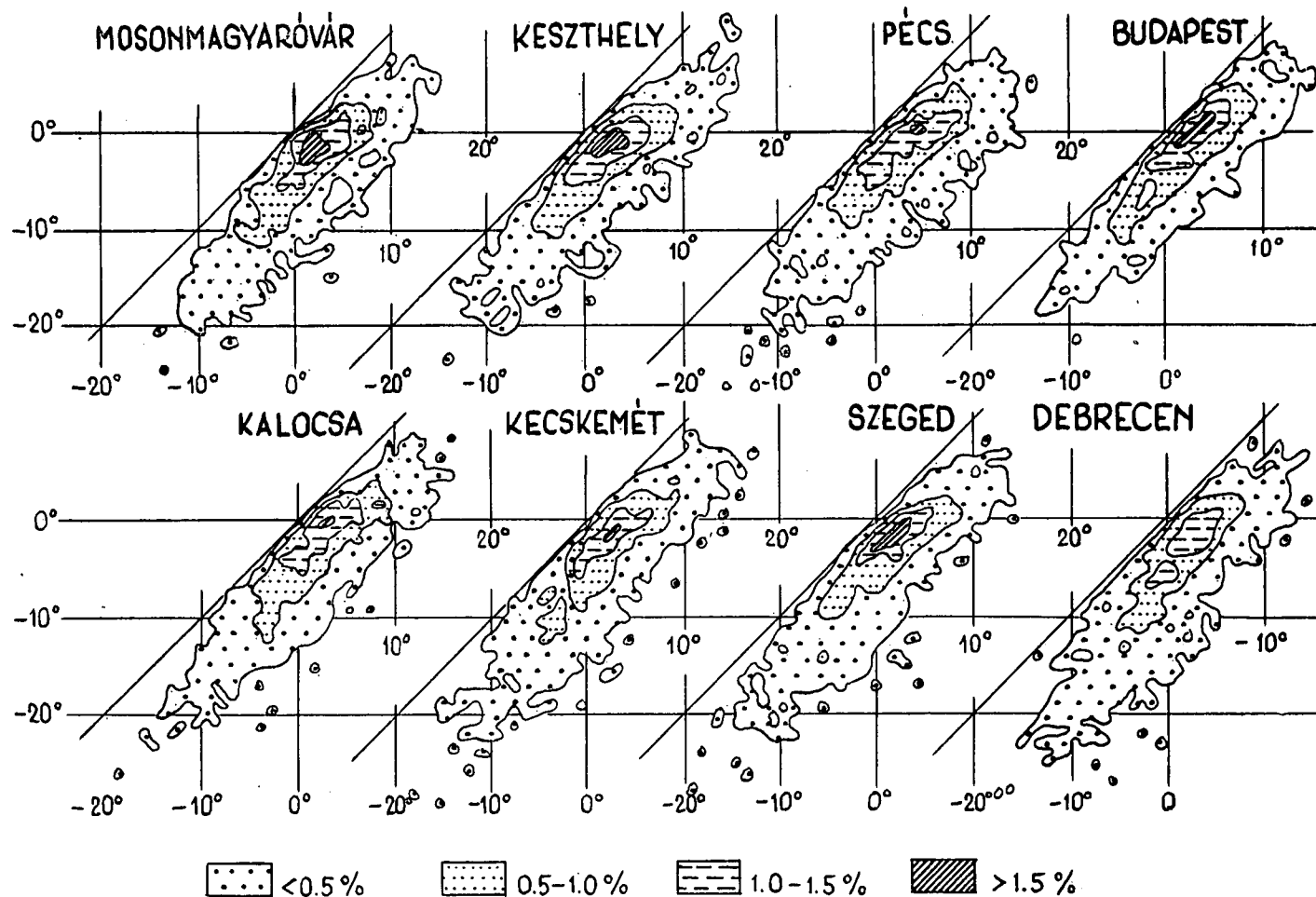


Fig. 1. The collective two-dimensional distribution field of the daily temperature extremes by 1 °C and by stations, January



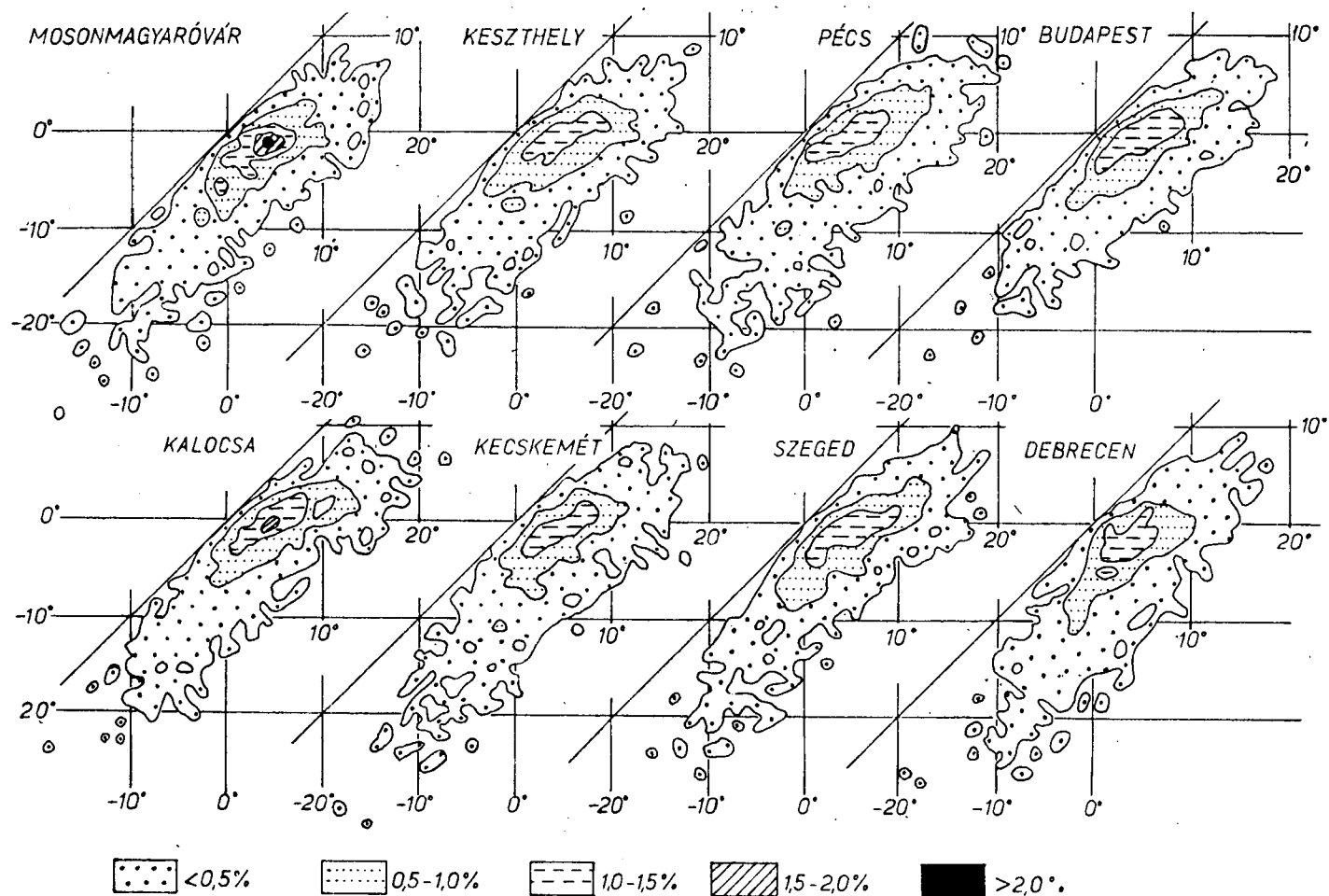


Fig. 2. The collective two-dimensional distribution field of the daily temperature extremities by  $1^{\circ}\text{C}$  and by stations, February

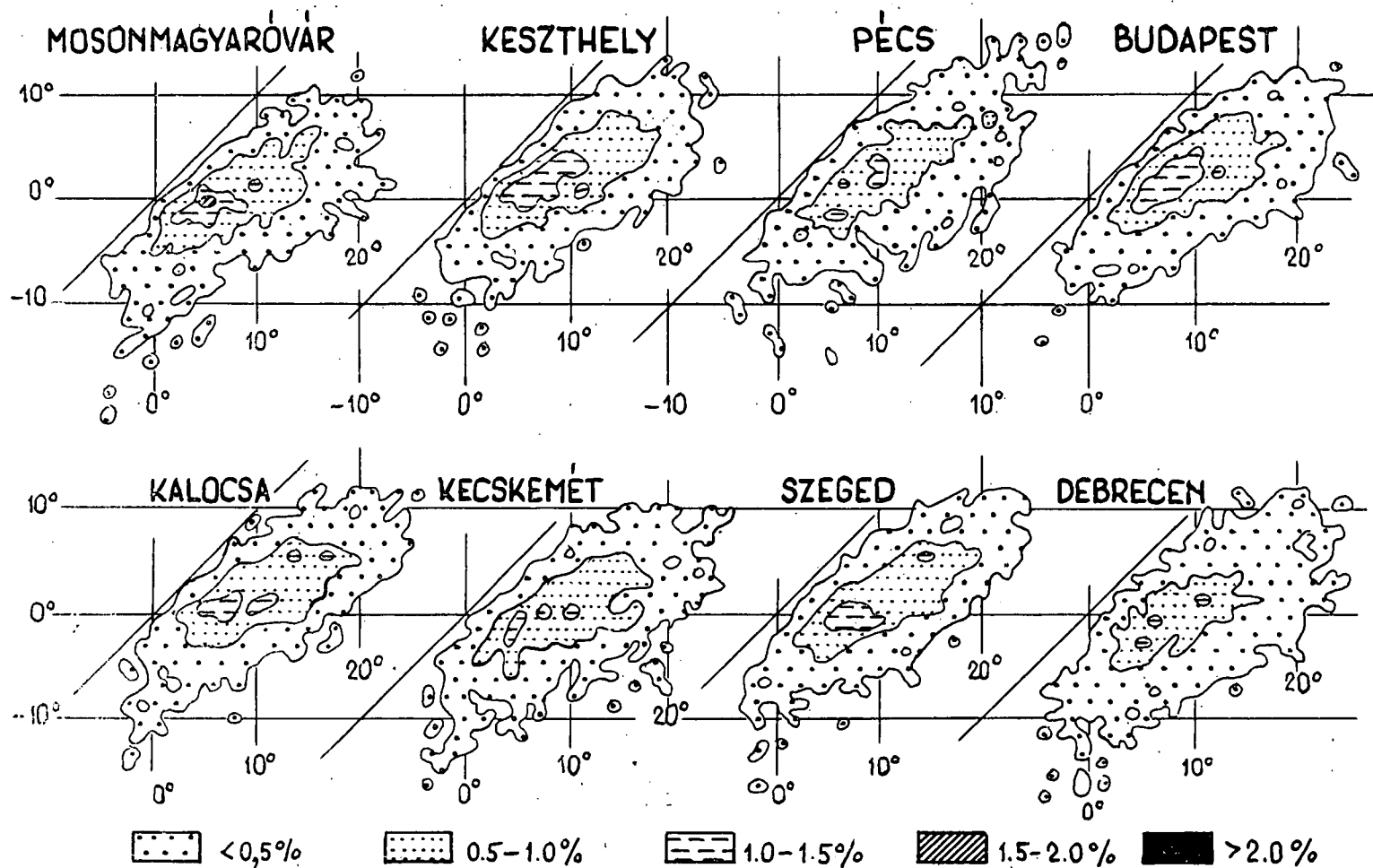


Fig. 3. The collective two-dimensional distribution field of the daily temperature extremities by 1 °C and by stations, March

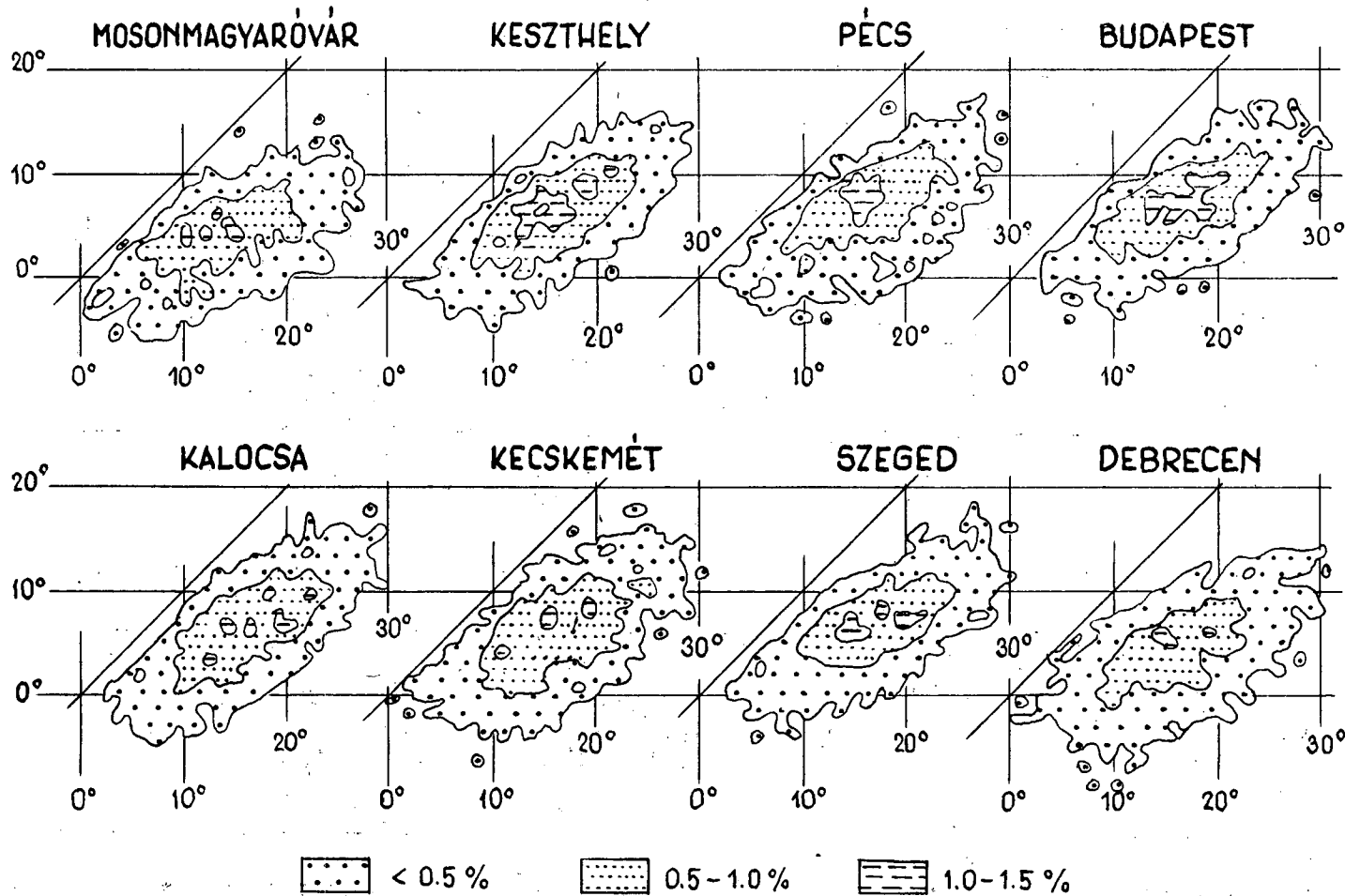


Fig. 4. The collective two-dimensional distribution field of the daily temperature extremities by  $1^{\circ}\text{C}$  and by stations, April

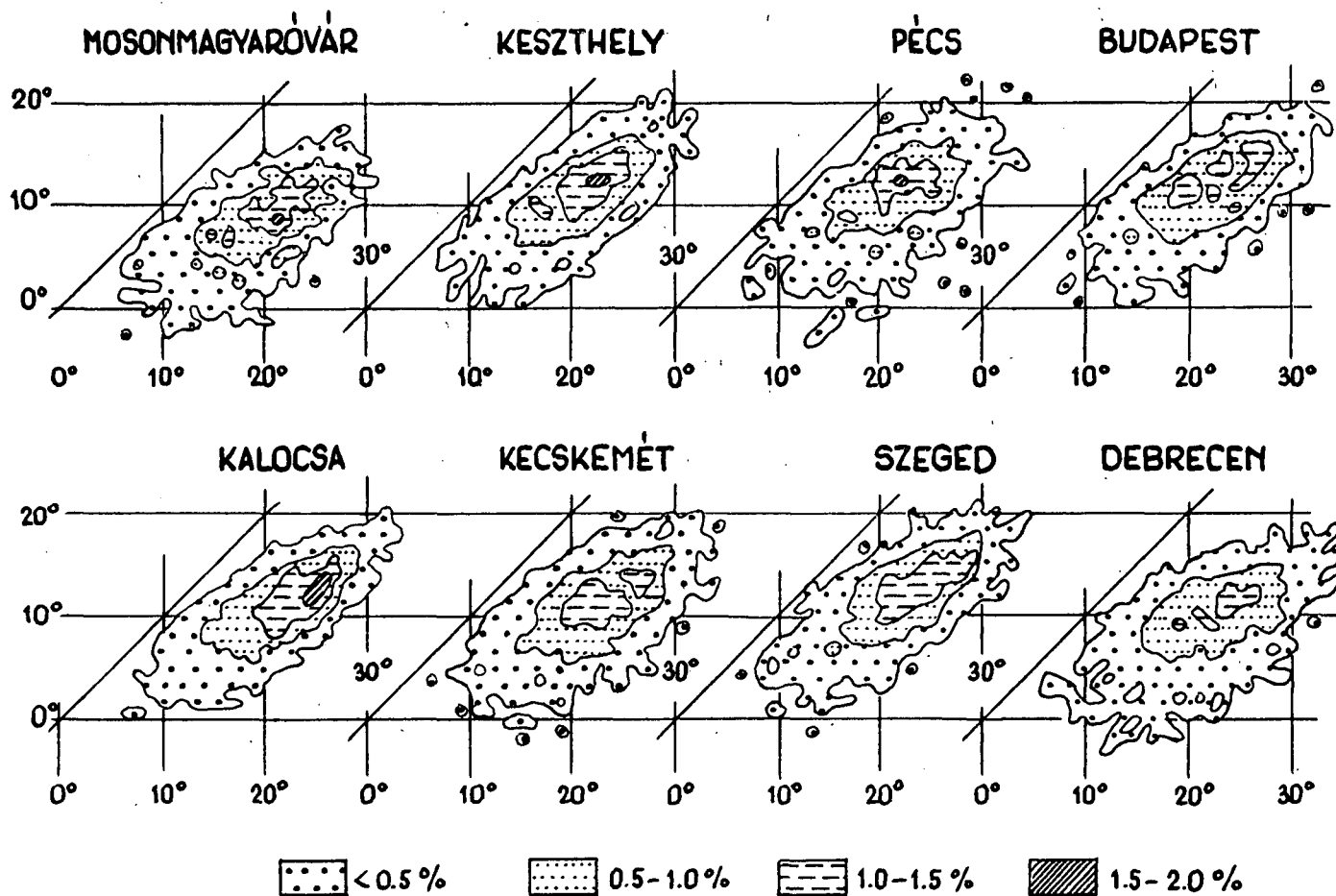


Fig. 5. The collective two-dimensional distribution field of the daily temperature extremes by 1°C and by stations, May

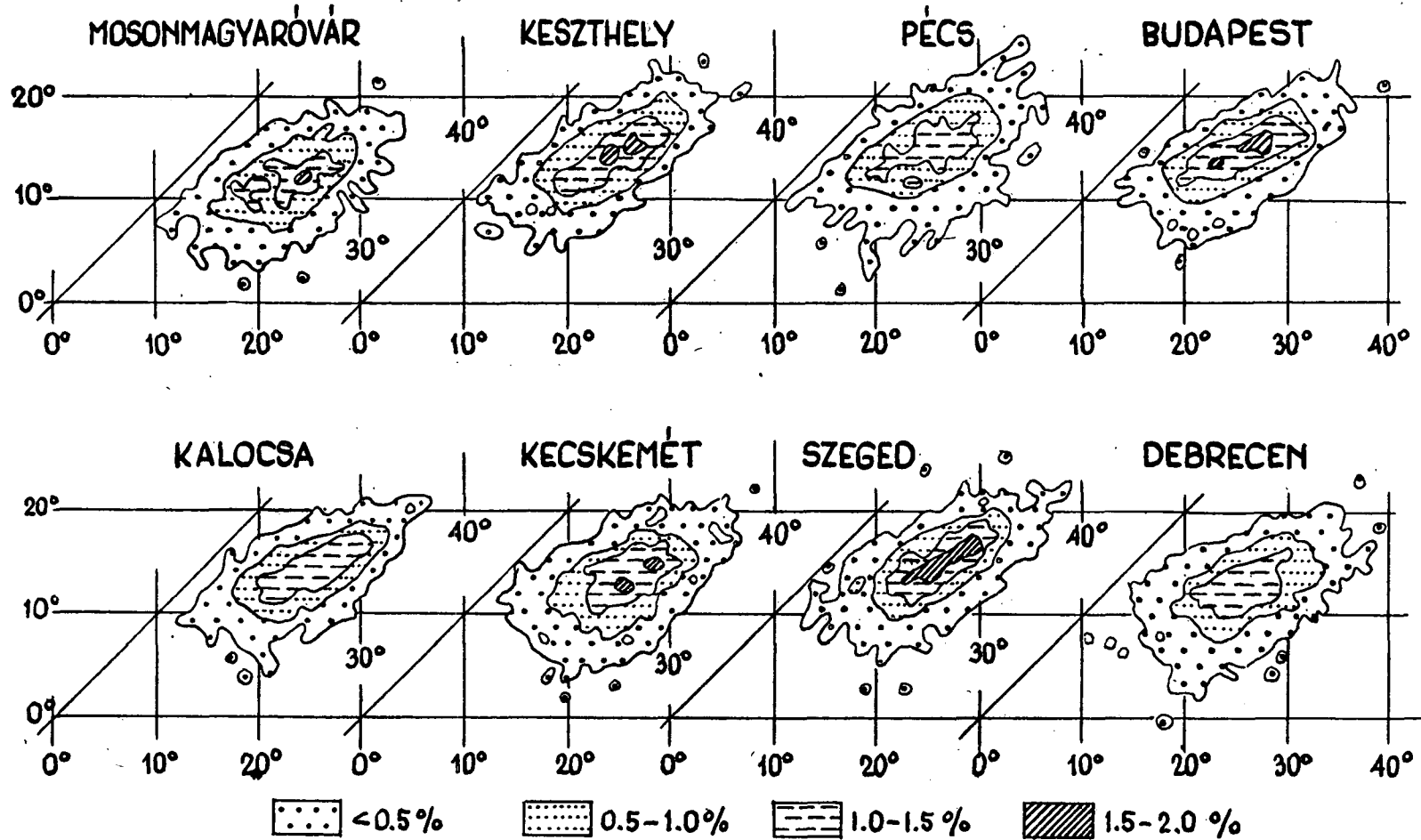


Fig. 6. The collective two-dimensional distribution field of the daily temperature extremities by 1 °C and by stations, June

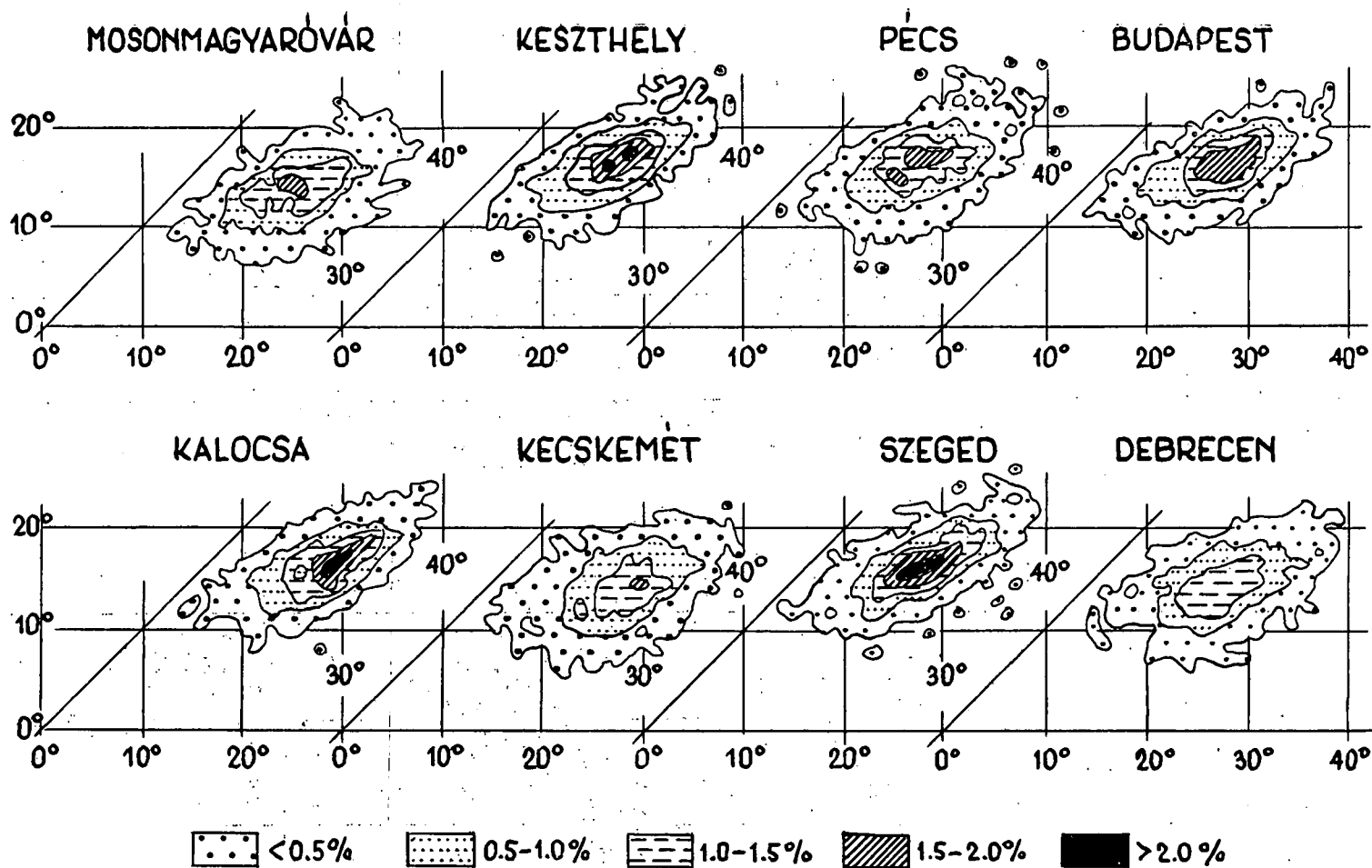


Fig. 7. The collective two-dimensional distribution field of the daily temperature extremities by 1 °C and by stations, July

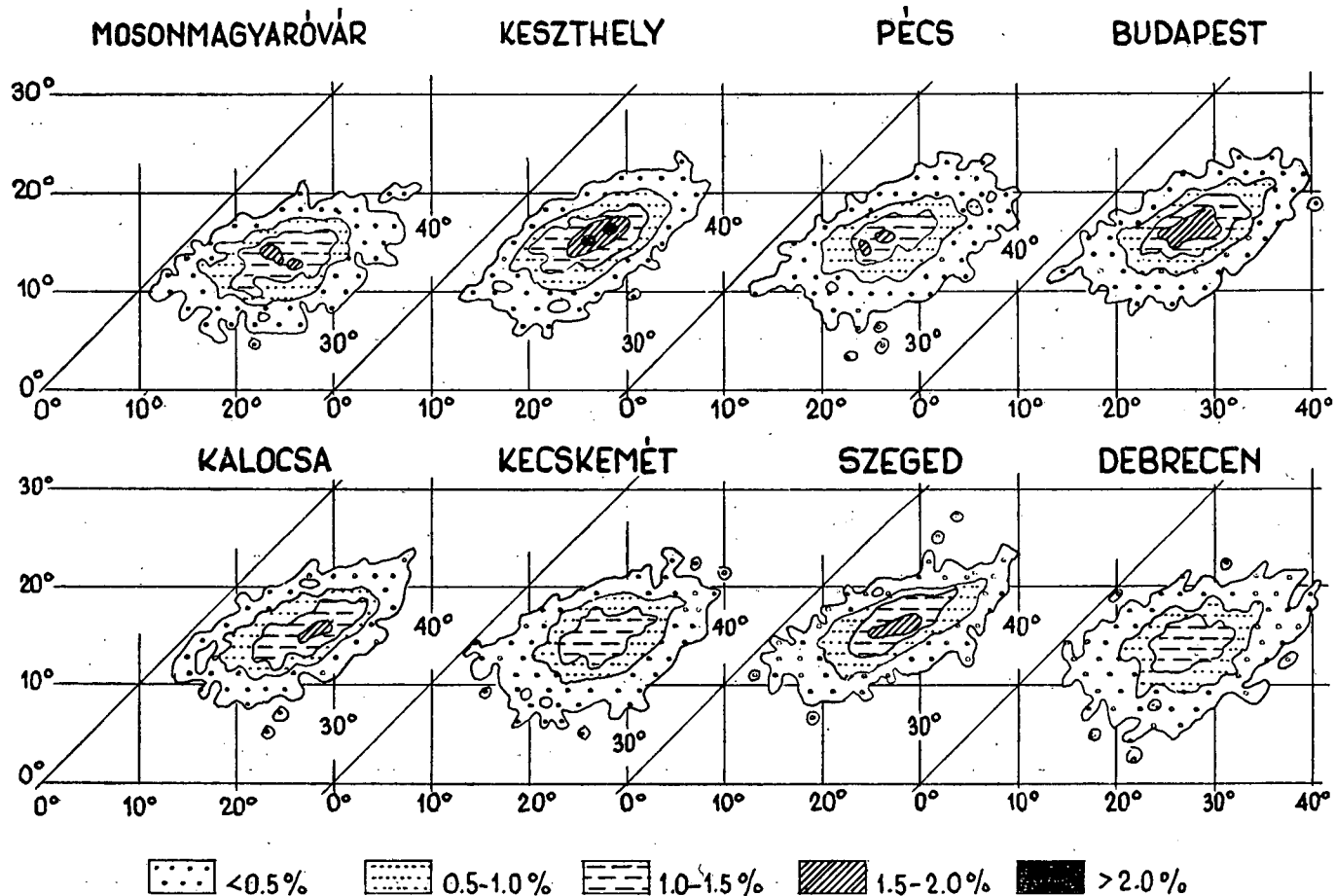


Fig. 8. The collective two-dimensional distribution field of the daily temperature extremes by  $1^{\circ}\text{C}$  and by stations, August

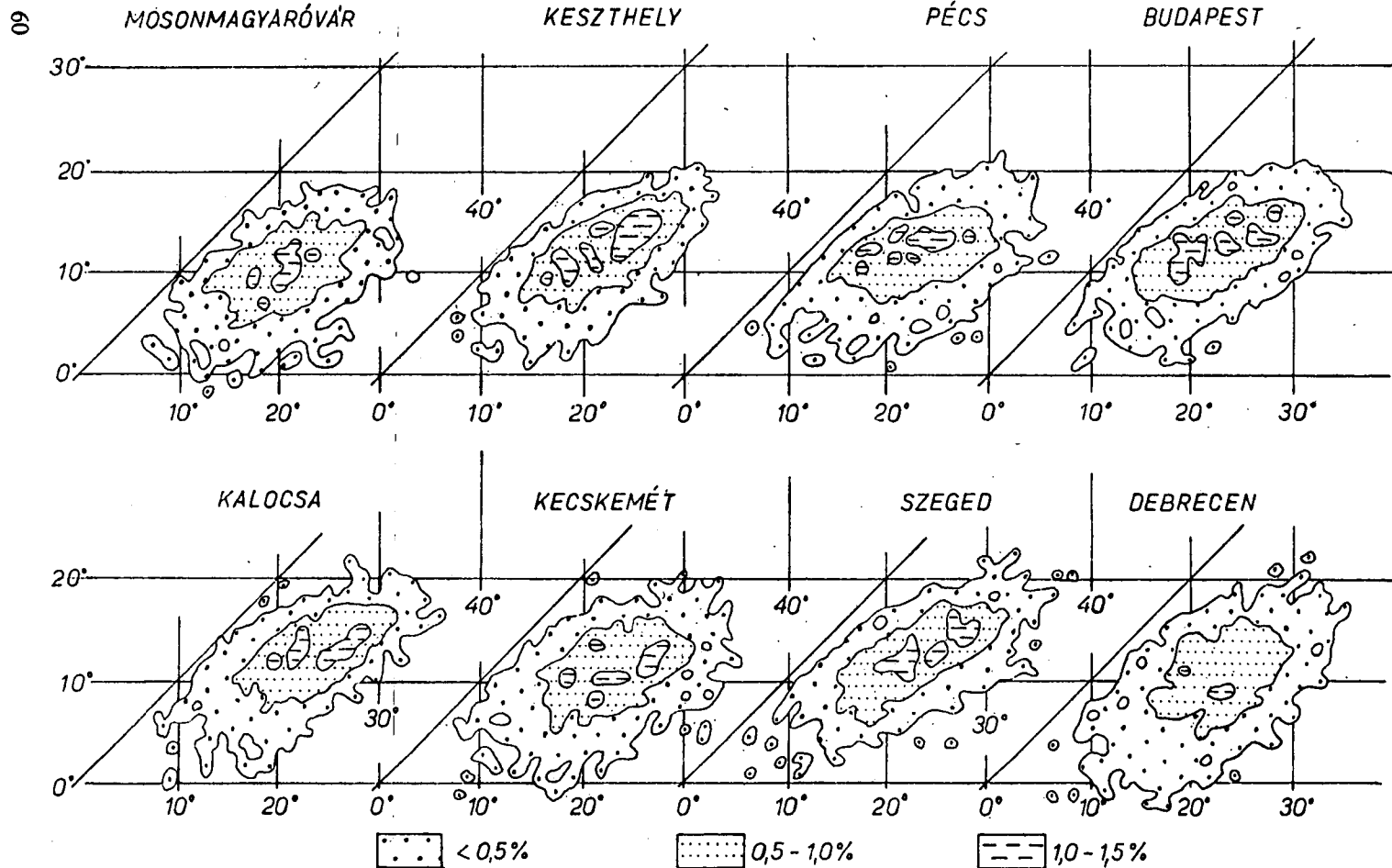


Fig. 9. The collective two-dimensional distribution field of the daily temperature extremities by  $1^{\circ}\text{C}$  and by stations, September



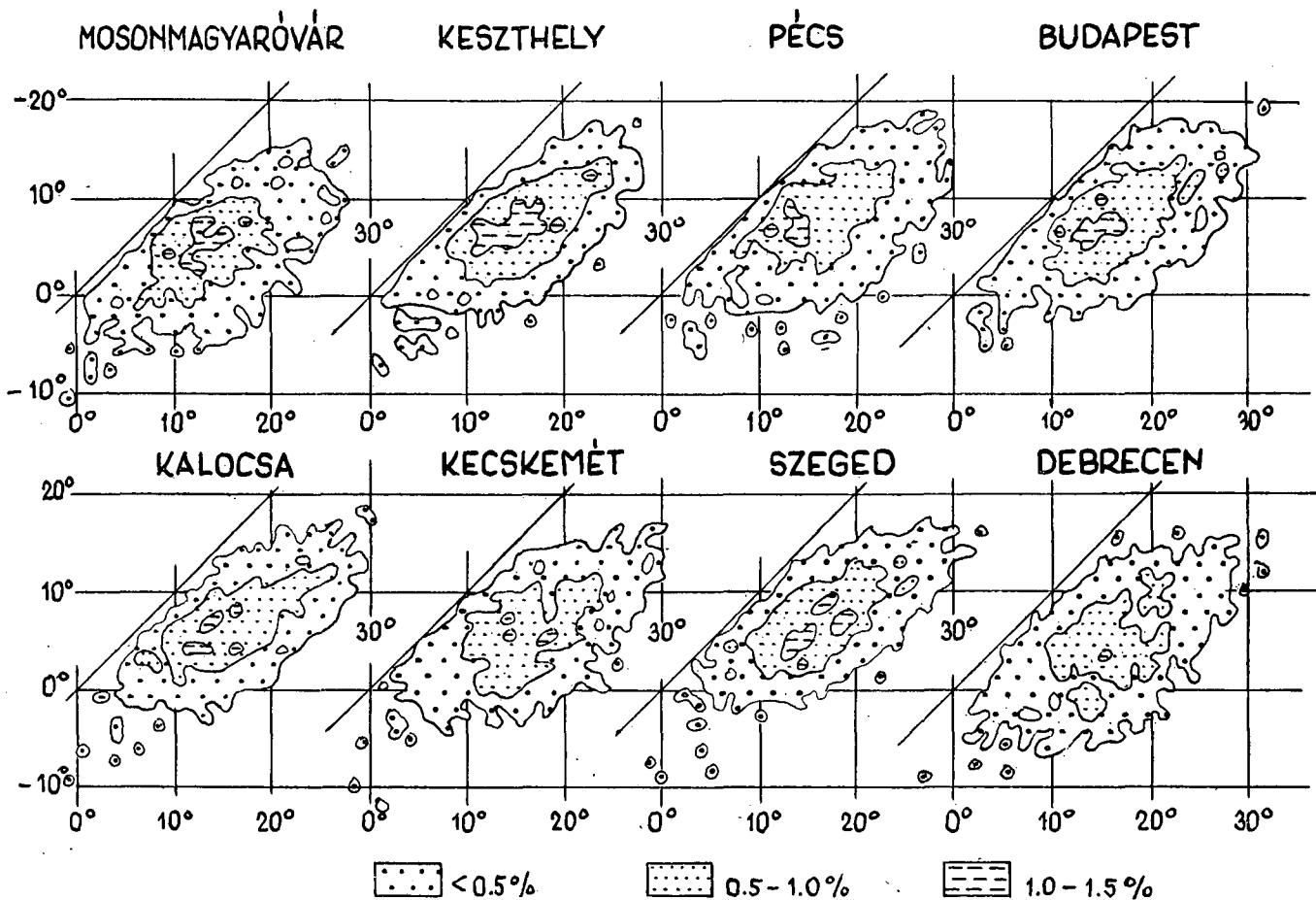


Fig. 10. The collective two-dimensional distribution field of the daily temperature extremities by 1 °C and by stations, October

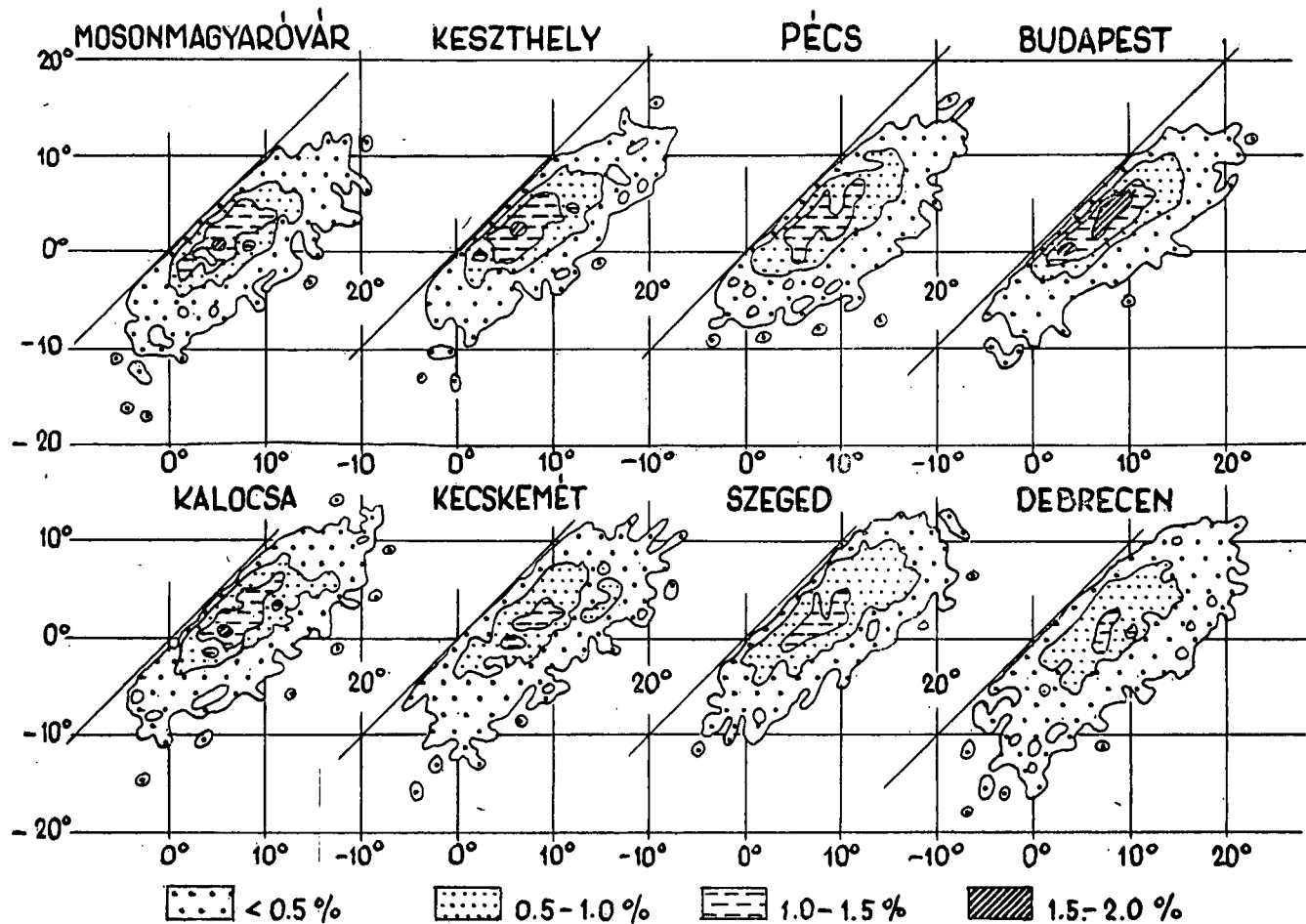


Fig. 11. The collective two-dimensional distribution field of the daily temperature extremes by  $1^{\circ}\text{C}$  and by stations, November

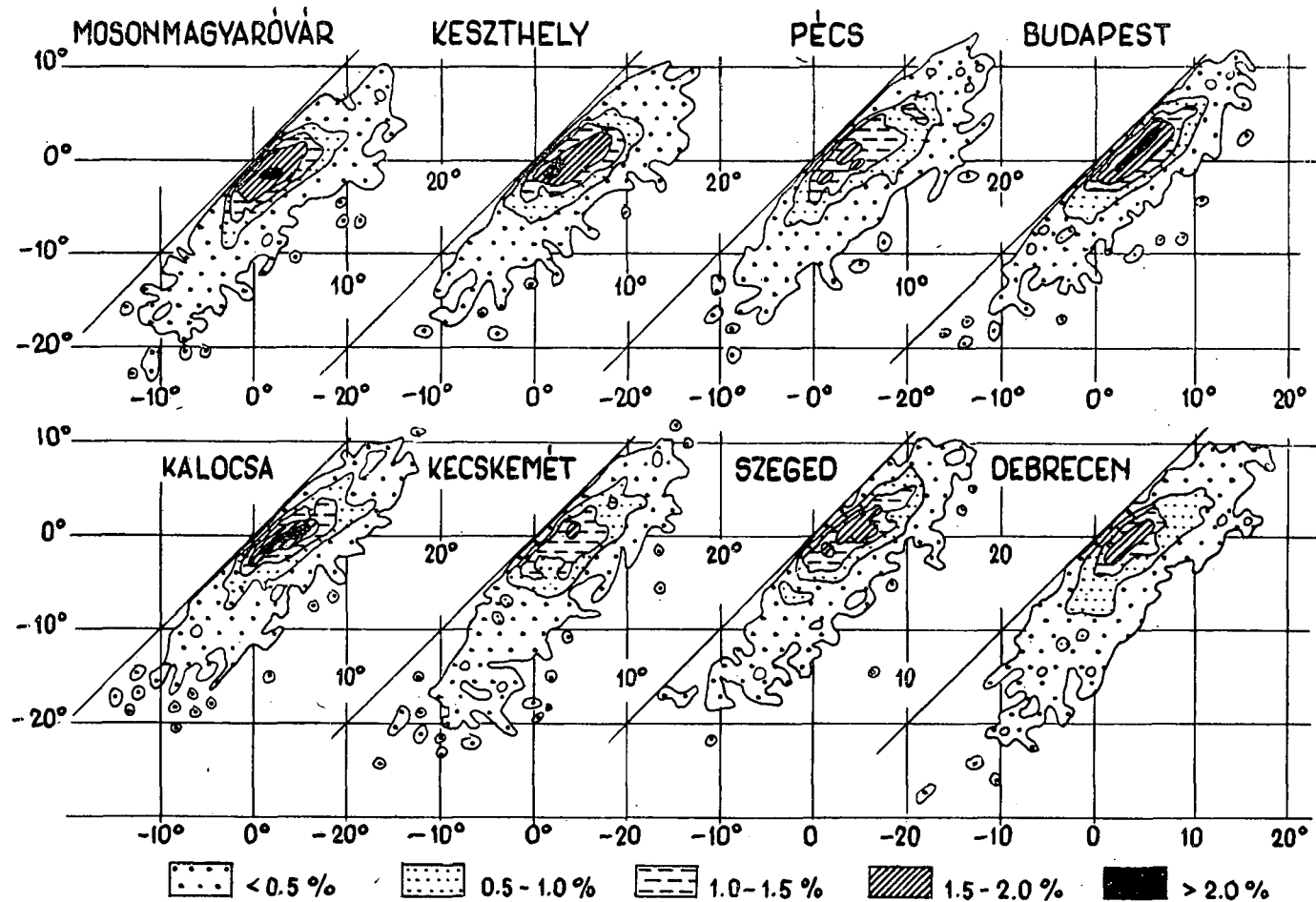


Fig. 12. The collective two-dimensional distribution field of the daily temperature extremes by 1 °C and by stations, December

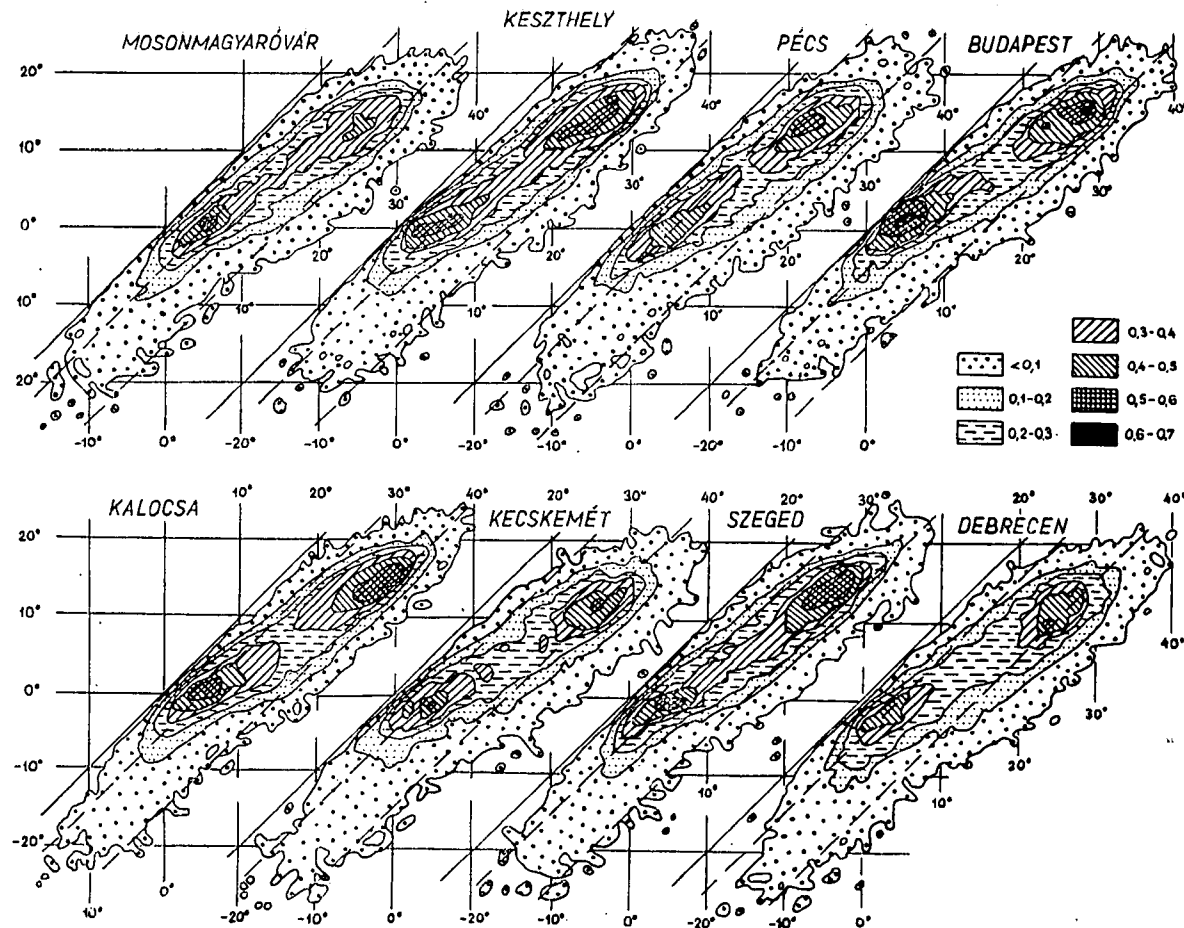


Fig. 13. The collective two-dimensional distribution field of the daily temperature extremes by 1°C and by stations, year

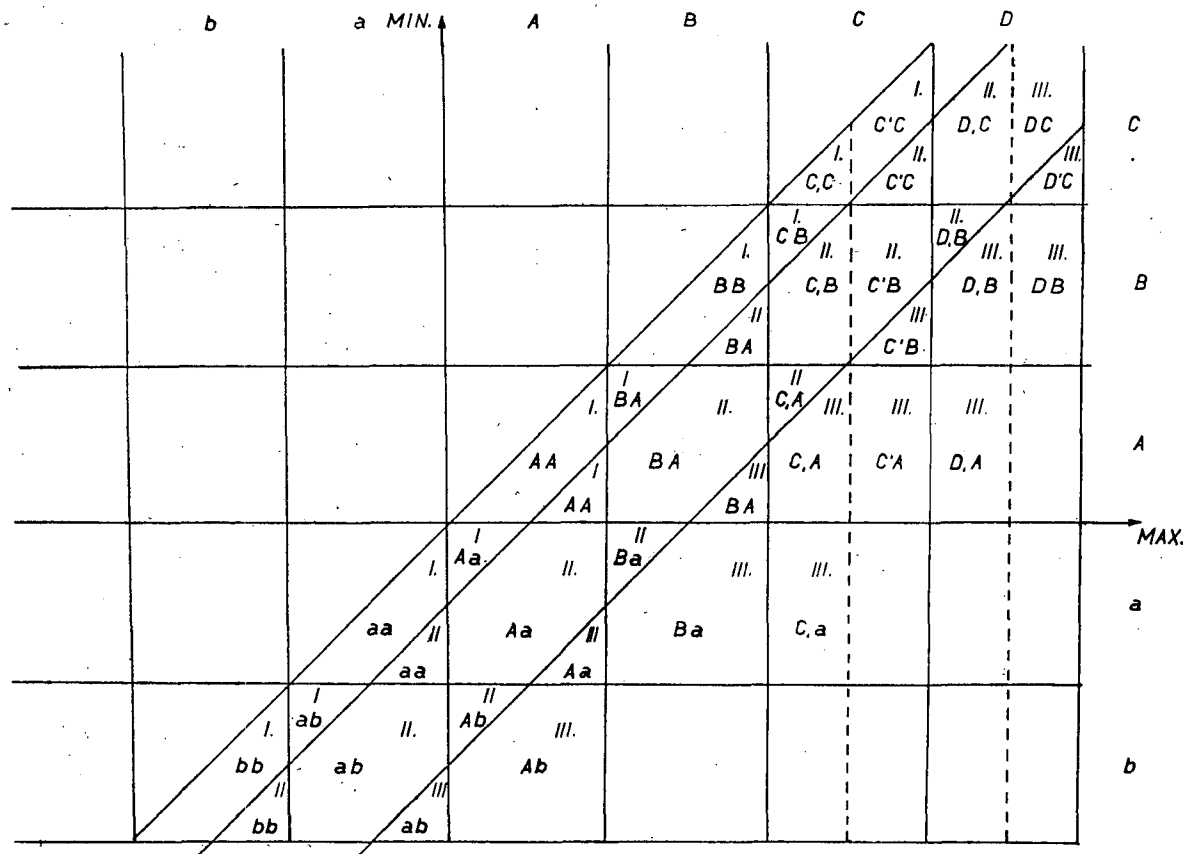


Fig. 14. The coding system of the daily temperature extremities, types of two-dimensional threshold days

Table 1

*The yearly collective frequency of the temperature extremities' threshold days according to two-dimensional codifying types by stations, day*

		1	2	3	4	5	6	7	8
c	c	0,55	—	—	—	—	0,09	—	0,04
b	b	0,55	0,51	0,55	0,44	0,62	0,62	0,91	0,55
b	c	0,22	0,04	0,33	0,05	0,22	0,88	0,47	0,91
a	a	15,16	15,55	18,10	16,02	15,07	19,14	18,14	19,57
a	b	8,36	6,27	8,04	5,44	4,71	12,53	9,78	15,19
a	c	0,22	0,11	0,40	0,02	0,22	0,69	0,37	1,24
A	A	50,32	48,06	40,19	58,39	49,28	33,42	35,73	26,66
A	a	54,91	50,33	56,18	44,49	48,58	62,78	60,97	68,00
A	b	0,88	0,80	0,99	0,29	0,84	1,39	0,69	2,92
B	B	19,36	21,83	19,49	19,07	16,94	13,00	15,40	10,08
B	A	80,67	81,86	79,95	74,24	79,75	75,85	79,09	69,90
B	a	6,57	4,38	8,07	2,81	4,16	11,72	6,02	17,03
C	C	—	—	—	0,02	0,02	—	0,02	—
C	B	44,48	51,68	47,55	45,44	44,74	35,72	45,88	30,02
C	A	21,04	16,17	19,28	14,78	17,37	27,50	17,70	32,47
C	a	0,04	—	0,08	0,02	—	0,11	—	0,44
C	C	0,18	0,77	0,58	0,66	0,40	0,04	0,29	0,02
C	B	46,65	50,83	45,59	56,94	55,73	45,76	52,80	39,42
C	A	3,62	0,95	4,89	2,34	1,68	7,34	1,83	12,82
D	C	0,29	1,61	1,13	2,79	1,99	0,29	1,28	0,04
D	B	10,50	12,74	12,78	19,08	20,73	14,64	16,13	15,52
D	A	0,06	—	0,07	0,02	0,02	0,37	0,04	0,80
D	C	0,18	0,47	0,13	1,02	1,19	0,15	0,69	0,15
D	B	0,44	0,29	0,88	0,88	0,99	1,13	1,02	1,46
Total		365,25	365,25	365,25	365,25	365,25	365,25	365,25	365,25

1 = Mosonmagyaróvár, 2 = Keszthely, 3 = Pécs, 4 = Budapest, 5 = Kalocsa, 6 = Kecskemét, 7 = Szeged, 8 = Debrecen

Table 2

*The yearly collective frequency of the daily temperature extremities' threshold days according to two-dimensional codifying types during little temperature oscillations by stations, day*

		1	2	3	4	5	6	7	8
b	c	—	—	—	0,02	—	0,07	0,03	—
b	b	0,32	0,32	0,34	0,13	0,26	0,22	0,44	0,18
a	b	1,24	1,12	1,52	0,54	1,07	1,35	1,44	0,65
a	a	11,98	12,19	14,47	9,90	11,28	14,94	13,62	9,95
A	a	22,93	19,74	23,93	14,75	20,12	20,14	21,40	11,88
A	A	34,84	32,35	26,17	34,69	28,89	20,12	22,17	11,64
B	A	10,53	10,39	10,07	6,43	8,36	5,84	7,38	2,17
B	B	7,92	9,77	8,02	5,51	6,87	4,97	5,77	1,50
C	B	1,32	2,17	1,43	0,51	1,47	0,51	1,10	0,03
C	C	—	—	—	0,02	0,02	—	0,02	—
C	C	—	0,03	—	—	—	—	0,03	—
D	C	—	—	—	—	—	—	—	—
Total		91,08	88,08	85,95	72,50	78,34	68,16	73,40	38,00

Table 3

*The yearly collective frequency of the daily temperature extremities' threshold days according to two-dimensional codifying types during medium temperature oscillations by stations, day*

		1	5	3	4	5	6	7	8
c	c	—	—	—	—	—	—	—	—
b	c	0,22	0,05	0,29	0,03	0,22	0,77	0,44	0,97
b	b	0,23	0,20	0,20	0,25	0,37	0,40	0,47	0,35
a	c	0,17	0,05	0,22	0,02	0,17	0,33	0,23	0,82
a	b	7,03	5,12	6,50	4,89	7,38	11,10	8,39	13,98
a	a	4,27	3,37	3,69	6,10	3,76	3,65	4,53	9,58
A	b	0,60	0,68	0,62	0,22	0,77	1,10	0,37	2,00
A	a	31,53	30,64	32,15	29,65	29,85	42,14	39,41	54,70
A	A	15,03	15,72	14,06	23,75	15,24	12,78	13,55	14,93
B	a	4,40	3,53	5,37	1,97	3,52	7,19	4,75	5,76
B	A	66,80	70,38	67,20	64,73	69,50	66,54	69,97	59,44
B	B	11,31	13,16	11,43	13,55	10,00	8,03	9,64	8,56
C,	A	13,80	11,01	12,43	7,78	13,90	18,08	13,95	12,45
C,	B	43,33	49,54	46,09	44,99	43,28	35,17	44,81	29,92
C,	B	39,95	48,40	39,62	46,60	51,76	36,37	49,16	22,14
C,	C	0,18	0,72	0,55	0,69	0,37	0,04	0,26	0,02
D,	B	5,00	9,95	5,66	8,95	14,06	5,73	10,77	1,85
D,	C	0,37	1,60	1,10	2,89	1,97	0,29	1,31	0,05
D,	C	0,12	0,32	0,11	0,37	0,75	0,04	0,37	0,08
Total		244,34	264,44	247,29	257,43	266,87	249,75	272,38	237,60

Table 4

*The yearly collective frequency of the daily temperature extremities' threshold days according to two-dimensional codifying types during great temperature oscillations by stations, day*

		1	2	3	4	5	6	7	8
b	c	—	—	0,2	—	—	0,02	—	—
a	c	0,05	0,03	0,13	—	0,02	0,37	0,12	0,42
a	b	0,10	0,03	0,13	0,02	0,02	0,09	0,03	0,59
A	c	0,23	0,13	0,32	0,05	0,05	0,29	0,26	0,92
A	a	0,07	0,02	0,16	0,15	0,03	0,33	0,07	1,22
B	a	2,18	0,58	2,78	0,80	0,66	4,49	1,24	11,43
B	A	2,41	1,25	2,56	3,07	1,90	3,65	1,70	8,25
C,	a	0,05	—	0,05	0,02	—	0,11	—	0,44
C,	A	7,13	4,19	6,83	6,98	3,88	9,84	3,79	20,17
C,	A	3,60	0,93	4,97	2,37	1,61	7,34	1,79	12,89
C,	B	6,64	2,33	5,92	10,26	3,98	9,60	3,62	17,29
D,	A	0,02	0,02	0,07	0,02	0,12	0,37	0,07	0,80
D,	B	6,51	2,78	7,12	10,08	6,02	9,64	5,33	13,72
D,	B	0,79	0,30	0,84	0,95	1,30	1,13	1,15	1,44
D,	C	0,05	0,15	0,07	0,55	0,40	0,07	0,29	0,07
D,	A	—	—	0,03	—	—	0,04	—	—
Total		29,83	12,73	31,98	35,32	19,99	47,34	19,47	89,65

Table 5

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, January*

		1	2	3	4	5	6	7	8
b	c	—	—	—	0,02	—	—	0,08	—
b	b	0,08	0,07	0,02	0,08	0,05	0,05	0,18	0,08
a	b	0,35	0,33	0,39	0,32	0,20	0,27	0,42	0,28
a	a	4,03	4,42	3,93	4,39	3,87	3,54	4,44	2,87
A	a	4,37	3,75	3,09	4,57	3,75	3,77	3,70	3,36
A	A	3,83	3,35	3,06	5,87	2,97	3,02	1,98	2,12
B	A	0,02	0,02	0,04	0,07	0,03	0,07	0,02	0,03
B	B	—	0,03	—	—	—	—	—	—
Total		12,68	11,97	10,53	15,32	10,87	10,72	10,76	8,71
b	c	0,10	0,02	0,13	—	0,13	0,30	0,23	0,38
b	b	0,27	0,25	0,13	0,18	0,35	0,23	0,39	0,13
a	c	0,04	0,01	0,05	0,02	0,07	0,05	0,08	0,23
a	b	3,68	2,59	2,64	2,68	3,65	4,27	4,05	5,73
a	a	2,64	2,47	2,30	2,53	2,20	2,48	2,75	2,80
A	b	0,13	0,18	0,23	0,02	0,25	0,25	0,17	0,32
A	a	7,62	8,48	9,00	6,30	8,10	8,71	9,15	9,64
A	a	2,86	2,94	3,54	3,07	3,44	2,32	2,18	1,80
B	a	0,07	0,13	0,27	0,05	0,10	0,07	0,12	0,18
B	A	0,82	1,80	1,84	0,83	1,75	1,29	0,95	0,55
Total		18,24	18,87	20,13	15,68	20,04	19,97	20,07	21,75
a	c	0,02	—	0,02	—	0,02	—	—	0,13
a	b	—	0,02	0,07	—	0,02	0,11	0,03	0,17
A	b	0,05	0,12	0,05	—	0,02	0,14	0,12	0,23
A	a	0,02	0,02	0,09	—	0,03	0,02	—	—
B	a	—	—	0,11	—	—	0,04	0,02	—
Total		0,09	0,16	0,34	—	0,09	0,31	0,17	0,53
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 6

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, February*

		1	2	3	4	5	6	7	8
b	c	0,02	—	—	—	—	—	—	—
b	b	0,10	0,05	0,05	0,02	0,05	0,02	—	—
a	b	0,18	0,17	0,07	0,10	0,07	0,05	0,12	0,10
a	a	2,53	1,72	1,61	1,59	1,66	1,30	1,24	0,86
A	a	2,94	2,33	2,24	3,01	2,53	2,43	2,54	2,26
A	A	1,45	2,50	2,54	4,34	1,84	1,79	2,00	1,24
B	A	0,02	0,03	0,05	0,15	0,08	0,05	0,02	0,02
B	B	—	—	0,02	—	0,02	—	—	—
Total		7,24	6,80	6,58	9,21	6,25	5,64	5,92	4,48
b	c	0,15	0,03	0,05	0,03	0,07	0,20	0,10	0,12
b	b	0,08	0,10	0,04	0,02	0,07	0,07	0,03	0,02
a	c	0,13	0,02	0,09	—	0,08	0,13	0,08	0,20
a	b	2,93	1,77	1,88	1,54	2,65	2,91	2,71	3,26
a	a	2,13	1,45	1,27	1,52	1,46	1,27	1,21	1,98
A	b	0,13	0,31	0,32	0,18	0,36	0,36	0,13	0,55



A	a	10,20	9,19	8,24	7,90	9,00	9,51	9,17	11,35
A	A	2,40	3,64	3,36	4,20	3,48	3,13	3,78	2,46
B	a	0,46	0,81	0,88	0,38	0,45	0,50	0,58	0,68
B	A	1,49	3,24	4,19	2,80	3,60	2,84	3,55	1,75
Total		20,10	20,56	20,34	18,57	21,21	21,01	21,34	22,37
b	c	—	—	—	—	—	—	0,02	—
a	c	0,08	0,05	0,09	—	0,03	0,23	0,13	0,17
a	b	0,10	0,10	0,14	0,02	0,02	0,27	0,08	0,18
A	b	0,15	0,10	0,25	0,03	0,07	0,16	0,03	0,40
A	a	0,03	0,08	0,11	0,07	0,07	0,21	0,05	0,17
B	a	0,26	0,21	0,36	0,08	0,25	0,43	0,31	0,21
B	A	0,02	0,10	0,13	0,02	0,10	0,05	0,12	0,02
C	A	0,02	—	—	—	—	—	—	—
Total		0,66 28,0	0,64 28,0	1,08 28,0	0,22 28,0	0,54 28,0	1,35 28,0	0,74 28,0	1,15 28,0

Table 7

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, March*

		1	2	3	4	5	6	7	8
A	a	0,40	0,25	0,23	0,19	0,22	0,14	0,14	0,10
a	a	1,58	0,88	0,80	0,81	0,94	0,91	0,91	0,65
A	A	1,87	5,72	2,07	3,02	2,09	1,43	3,58	1,12
B	A	0,12	0,30	0,20	0,34	0,05	0,13	0,24	0,15
B	B	—	0,08	0,05	—	0,03	—	0,02	0,02
Total		3,97	7,23	3,35	4,36	3,33	2,61	4,89	2,04
a	b	0,22	0,05	0,05	0,03	0,13	0,27	0,10	0,22
a	a	0,42	0,25	0,20	0,15	0,30	0,27	0,29	0,47
A	b	0,20	0,03	0,02	—	0,02	0,09	0,03	0,15
A	a	9,88	6,24	6,25	5,77	6,56	8,09	7,03	9,58
A	A	3,97	1,20	3,74	5,11	4,15	3,95	1,91	2,74
B	a	1,50	1,13	0,88	0,89	1,27	1,64	1,23	1,62
B	A	7,80	12,24	11,90	11,52	11,85	9,32	11,80	8,18
B	B	0,03	0,18	0,30	0,27	0,08	0,13	0,10	0,13
C,	A	0,13	0,30	0,50	0,35	0,55	0,23	0,59	0,15
C,	B	—	0,10	0,48	0,15	0,15	0,05	0,14	—
Total		24,15	21,72	24,33	24,24	25,06	24,04	23,22	23,24
a	b	0,03	—	—	—	—	—	0,02	0,05
A	b	0,07	0,02	0,07	—	0,02	0,04	0,03	0,18
A	a	—	0,05	0,13	0,02	0,07	0,16	0,07	0,37
B	a	1,48	0,48	1,16	0,52	0,50	1,66	0,73	3,10
B	A	0,98	0,88	1,21	1,15	1,32	1,59	1,23	1,22
C,	a	0,02	—	0,05	0,02	—	—	—	0,10
C,	A	0,30	0,62	0,66	0,69	0,70	0,88	0,81	0,60
C,	B	—	—	0,04	—	—	0,02	—	—
Total		2,88 31,0	2,05 31,0	3,32 31,0	2,40 31,0	2,61 31,0	4,35 31,0	2,89 31,0	5,72 31,0

Table 8

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, April*

		1	2	3	4	5	6	7	8
a	a	—	—	—	—	—	0,02	—	—
A	a	0,14	0,07	0,04	0,02	0,02	0,07	0,03	0,10
A	A	1,37	0,80	0,95	0,85	0,77	0,80	0,85	0,57
B	A	0,32	0,77	0,75	1,02	0,52	0,70	0,45	0,23
B	B	0,03	0,16	0,18	0,27	0,15	0,13	0,10	0,02
Total		1,86	1,80	1,92	2,16	1,46	1,72	1,43	0,92
A	a	1,98	0,77	0,57	0,41	0,82	0,97	0,72	1,50
A	A	2,27	1,73	1,48	1,56	1,54	1,52	1,27	1,28
B	a	1,24	0,33	0,32	0,34	0,48	0,79	0,43	1,23
B	A	14,91	17,00	14,80	15,69	15,87	14,66	15,62	12,77
B	B	0,36	1,33	1,04	1,42	1,17	0,66	1,05	0,48
C,	A	1,42	1,68	2,15	1,86	2,42	1,77	2,33	1,53
C,	B	0,51	2,22	2,32	2,52	1,87	1,27	2,27	0,77
C,	B	0,10	0,30	0,50	0,46	0,57	0,36	0,67	0,40
D,	B	—	—	—	—	—	—	0,02	—
Total		22,79	25,36	23,18	24,26	24,72	22,00	24,38	19,96
A	a	0,02	—	0,02	—	—	0,02	—	0,08
B	a	1,05	0,12	0,61	0,15	0,22	0,68	0,20	2,22
B	A	1,54	0,67	1,05	0,74	1,03	1,66	0,92	1,85
C,	a	—	—	0,02	—	—	—	—	0,13
C,	A	2,42	1,55	2,20	1,86	1,69	2,86	2,03	3,48
C,	A	0,25	0,23	0,64	0,32	0,35	0,59	0,40	0,98
C,	B	0,07	0,27	0,36	0,54	0,53	0,45	0,62	0,35
D,	B	—	—	—	—	—	0,02	0,02	0,03
Total		5,35	2,84	4,90	3,58	3,82	6,28	4,19	9,12
		30,0	30,0	30,0	30,0	30,0	30,0	30,0	30,0

Table 9

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying during little, medium and great temperature oscillations, day, May*

		1	2	3	4	5	6	7	8
a	a	—	—	0,02	—	—	—	—	—
A	A	0,34	0,18	0,13	0,07	0,07	0,07	0,07	0,07
B	A	0,41	0,58	0,86	0,44	0,45	0,38	0,23	0,20
B	B	0,40	0,88	1,45	0,74	0,58	0,59	0,48	0,15
C,	B	—	0,05	0,18	0,07	0,03	—	0,03	—
C,	B	—	0,03	0,02	—	—	—	—	—
Total		1,15	1,72	2,66	1,32	1,13	1,04	0,81	0,42
A	a	0,03	—	—	—	—	0,04	—	0,02
A	A	0,02	0,08	0,07	0,05	0,13	0,05	0,07	0,01
B	a	0,17	—	0,02	—	0,02	0,04	—	0,02
B	A	10,15	7,34	5,52	5,68	6,49	6,44	5,58	5,82
B	B	2,05	3,14	2,00	2,91	2,63	2,58	2,71	1,52

C,	A	3,18	2,45	1,95	1,66	2,47	2,58	2,19	2,38
C,	B	5,60	8,85	8,80	8,42	8,25	6,60	8,38	5,28
C,	B	2,05	4,75	4,23	5,41	5,79	3,99	6,60	2,88
C,	C	—	—	0,05	—	—	—	0,02	—
D,	B	—	0,15	0,16	0,47	0,33	0,30	0,27	0,08
D,	C	—	—	0,04	0,02	0,02	—	—	—
Total		23,25	26,74	22,84	24,62	26,13	22,62	25,82	18,01
B	a	0,17	—	0,16	—	—	0,07	0,02	0,42
B	A	0,96	0,28	0,23	0,22	0,22	0,47	0,17	0,75
C,	a	0,02	—	0,02	—	—	—	—	0,05
C,	A	3,14	1,10	1,90	1,74	1,12	2,63	1,12	4,02
C,	A	0,74	0,08	1,04	0,61	0,25	1,14	0,57	2,95
C,	B	1,50	0,98	1,72	1,98	1,72	2,29	1,80	3,10
D,	A	—	—	—	0,02	—	0,02	—	0,12
D,	B	0,07	0,10	0,43	0,49	0,43	0,72	0,69	1,13
Total		6,60	2,54	5,50	5,06	3,74	7,34	4,37	12,57
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 10

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, June*

		1	2	3	4	5	6	7	8
B	A	0,19	0,05	0,02	0,02	0,05	—	0,03	0,02
B	B	0,76	0,57	0,80	0,70	0,58	0,48	0,50	0,33
C,	B	0,03	0,12	0,07	0,07	0,03	0,04	0,05	0,03
C,	C	—	—	0,02	—	—	—	0,02	—
Total		0,98	0,74	0,91	0,79	0,66	0,52	0,60	0,38
B	A	3,74	1,12	0,50	0,52	0,77	1,00	0,63	1,03
B	B	2,98	2,80	2,23	1,90	2,08	1,93	1,65	1,37
C,	A	2,10	1,07	0,89	0,72	1,05	1,25	0,75	1,48
C,	B	8,45	10,50	9,52	9,55	8,93	7,50	9,01	7,02
C,	B	5,89	9,42	9,26	10,31	10,12	9,89	10,85	6,36
C,	C	—	0,18	0,25	0,15	0,03	0,05	0,17	—
D,	B	0,27	1,22	0,89	1,55	2,12	0,93	2,39	0,82
D,	C	0,02	0,20	0,41	0,40	0,20	0,09	0,33	0,07
D,	C	—	—	0,02	—	—	0,02	0,03	0,02
Total		23,45	26,52	23,97	25,10	25,30	22,66	25,81	18,18
B	a	—	—	—	—	—	—	—	0,03
B	A	0,05	—	0,07	0,03	0,03	0,05	0,02	0,08
C,	A	1,40	0,37	0,63	0,38	0,30	1,13	0,17	1,64
C,	A	0,81	0,12	0,55	0,18	0,17	1,13	0,10	1,82
C,	B	2,52	1,48	1,90	1,82	1,90	1,57	1,28	3,97
D,	A	0,02	—	0,40	—	—	0,02	—	0,10
D,	B	0,77	0,73	1,50	1,62	1,57	2,68	1,77	3,67
D,	B	—	0,02	0,07	0,05	0,02	0,02	0,15	0,13
D,	C	—	0,02	—	0,03	0,05	0,04	0,10	—
Total		5,57	2,74	5,12	4,11	4,04	6,82	3,59	11,44
		30,0	30,0	30,0	30,0	30,0	30,0	30,0	30,0

Table 11

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, July*

		1	2	3	4	5	6	7	8
B	A	0,05	—	—	—	—	—	—	—
B	B	0,68	0,53	0,52	0,43	0,38	0,41	0,37	0,17
C,	B	0,02	0,25	0,12	0,18	0,18	0,14	0,17	0,05
C,	C	—	—	—	0,02	0,02	0,02	—	—
C'	C	—	—	0,02	—	—	—	0,03	—
Total		0,75	0,78	0,66	0,63	0,58	0,57	0,57	0,22
B	A	0,65	0,08	—	0,03	0,02	0,07	—	0,05
B	B	2,32	1,17	0,80	0,60	0,75	0,38	0,33	0,67
C,	A	0,77	0,23	0,21	0,07	0,15	0,29	0,07	0,45
C,	B	9,76	8,52	7,00	5,98	6,47	5,96	6,25	5,84
C,	B	8,92	12,67	11,44	12,68	12,06	10,11	12,54	8,07
C'	C	0,03	0,03	0,05	0,27	0,25	0,07	0,23	0,02
D,	B	0,80	3,02	2,63	3,65	4,02	2,20	3,70	1,48
D,	C	0,17	0,83	1,38	1,97	1,07	0,52	1,68	0,27
D'	C	—	0,08	0,11	0,25	0,30	0,02	0,35	0,08
Total		23,42	26,62	23,62	25,50	25,09	19,62	25,15	16,93
C,	A	0,42	0,03	0,14	0,02	0,02	0,20	0,03	0,48
C,	A	0,50	0,05	0,16	—	0,03	0,41	0,02	1,37
C'	B	3,10	1,23	1,73	1,38	1,23	3,68	0,82	4,55
D,	A	0,02	—	—	—	—	0,05	—	0,10
D,	B	2,57	2,00	3,90	2,72	3,33	5,20	3,23	6,02
D'	B	0,22	0,10	0,52	0,50	0,40	1,04	0,63	1,13
D'	C	—	0,18	0,23	0,25	0,32	0,23	0,55	0,18
E,	B	—	—	0,02	—	—	—	—	0,02
E,	C	—	—	0,02	—	—	—	—	—
Total	i	6,83	3,59	6,72	4,87	5,33	10,81	5,28	13,85
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 12

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, August*

		1	2	3	4	5	6	7	8
B	A	0,07	0,03	—	—	—	—	—	—
B	B	0,94	0,27	0,59	0,57	0,40	0,43	0,35	0,37
C,	B	0,03	0,25	0,27	0,13	0,13	0,14	0,05	0,05
Total		1,04	0,55	0,86	0,70	0,53	0,57	0,40	0,42
B	A	1,17	0,33	0,07	0,03	0,13	0,27	0,18	0,40
B	B	2,38	1,36	1,02	0,72	1,08	0,84	0,85	0,83
C,	A	1,66	0,44	0,36	0,17	0,23	0,61	0,02	1,05
C,	B	10,00	9,82	7,80	7,56	8,06	7,02	7,40	6,23
C'	B	7,25	11,05	9,72	11,68	10,50	8,31	12,00	7,45
C'	C	0,02	0,23	0,27	0,23	0,10	0,02	0,20	0,02
D,	B	0,45	2,50	2,11	2,64	2,55	1,55	3,52	0,90
D,	C	—	0,53	0,66	0,85	0,65	0,27	0,85	0,05
D'	C	—	0,05	0,05	0,12	0,12	0,04	0,18	—
Total		22,93	26,31	22,06	24,00	23,42	18,53	25,20	16,93

C,	A	0,65	0,25	0,20	—	0,12	0,50	0,02	1,02
C'	A	0,70	0,08	0,34	0,17	0,07	0,89	0,02	1,83
C'	B	3,30	1,43	2,21	1,95	1,75	4,00	1,08	4,00
D,	A	0,02	0,02	0,02	—	—	0,07	—	0,30
D,	B	2,18	2,05	4,16	3,52	4,20	5,16	2,87	5,37
D'	B	0,13	0,18	0,95	0,38	0,53	0,77	0,78	0,98
D'	C	0,05	0,13	0,20	0,28	0,38	0,11	0,63	0,15
Total		7,03	4,14	8,08	6,30	7,05	11,50	5,40	13,65
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 13

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, September*

		1	2	3	4	5	6	7	8
A	A	0,12	0,07	0,11	0,05	0,08	0,09	0,03	0,05
B	A	0,73	0,50	0,47	0,23	0,28	0,21	0,27	0,07
B	B	1,02	0,98	1,24	1,15	1,03	0,59	0,78	0,40
C,	B	0,03	0,05	0,13	0,07	0,05	0,02	0,07	—
C,	C	—	—	—	—	—	0,02	—	—
Total		1,90	1,60	1,95	1,50	1,44	0,93	1,15	0,52
A	a	—	—	—	—	0,02	0,02	—	0,02
A	A	0,08	0,02	0,05	0,02	0,05	0,04	0,07	0,02
B	a	0,03	—	—	—	—	—	—	0,05
B	A	8,65	5,24	3,34	4,00	4,18	5,12	4,35	6,20
B	B	2,90	3,30	2,98	3,30	2,78	2,23	2,70	1,72
C,	A	2,02	1,67	1,38	1,65	1,62	2,12	1,82	2,98
C,	B	5,74	8,60	7,78	7,75	7,44	5,90	8,02	4,80
C'	B	2,28	5,63	4,92	5,42	5,80	3,53	6,23	3,80
C'	C	—	—	0,04	0,02	0,03	—	0,02	0,02
D,	B	0,02	0,40	0,63	0,58	0,52	0,37	0,55	0,32
D,	C	—	0,03	0,07	0,03	0,03	0,02	0,10	0,02
Total		21,73	24,89	21,19	22,77	22,47	19,35	23,86	19,95
B	a	0,10	—	—	—	—	0,07	—	0,02
B	A	0,48	0,12	0,23	0,17	0,17	0,57	0,05	0,60
C,	A	2,78	1,22	1,47	1,23	1,45	2,75	0,63	3,13
C'	A	0,98	0,32	1,24	0,80	0,58	1,53	0,58	2,60
C'	B	1,47	1,32	2,50	2,23	2,22	3,02	2,07	1,60
D,	a	—	—	—	—	—	—	—	0,02
D,	A	0,08	—	0,02	—	0,02	0,20	0,02	0,18
D,	B	0,48	0,53	1,36	1,28	1,62	1,52	1,58	1,28
D'	B	—	—	0,04	0,02	0,03	0,02	0,03	—
D'	A	—	—	—	—	—	0,04	—	—
D'	C	—	—	—	—	—	—	0,03	—
		6,37	3,51	6,86	5,73	6,09	9,72	4,99	9,53
Total		30,0	30,0	30,0	30,0	30,0	30,0	30,0	30,0

Table 14

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, October*

		1	2	3	4	5	6	7	8
a	a	0,02	—	0,02	—	—	—	—	—
A	a	0,18	0,03	0,05	0,03	0,05	0,02	0,05	0,03
A	A	2,34	1,55	1,79	1,60	1,60	1,34	1,48	0,85
B	A	1,20	1,50	1,45	1,80	1,00	0,89	1,07	0,60
B	B	0,43	0,88	3,06	1,25	0,70	0,47	0,82	0,42
C,	C	—	—	—	—	—	—	0,02	—
Total		4,17	3,96	6,37	4,68	3,35	2,72	3,44	1,90
a	b	—	—	—	—	—	0,02	0,18	0,03
a	a	0,03	—	—	—	0,02	0,02	0,02	0,02
A	b	—	—	—	—	0,02	0,02	—	—
A	a	1,37	0,35	0,25	0,37	0,35	0,64	0,28	1,13
A	A	2,32	1,09	0,80	0,98	1,32	1,00	1,08	1,17
B	a	0,85	0,23	0,18	0,18	0,23	0,43	0,15	0,98
B	A	16,06	16,05	11,90	15,26	14,88	14,46	15,30	13,60
B	B	1,15	2,50	2,00	2,20	1,85	1,45	2,04	1,28
C,	A	0,87	1,42	1,41	1,30	1,82	1,63	1,57	1,03
C,	B	1,22	3,29	1,77	2,97	3,05	2,13	3,50	1,86
C'	R	0,05	0,35	0,82	0,62	0,90	0,63	0,78	—
Total		23,92	25,27	19,13	23,88	24,44	22,43	24,90	21,10
A	a	—	—	—	—	—	—	—	0,05
B	a	0,90	0,07	0,27	0,03	0,12	0,89	0,03	2,60
B	A	0,97	0,78	1,14	0,75	0,97	1,74	0,70	2,06
C,	a	—	—	0,02	—	—	—	—	0,10
C,	A	0,90	0,78	3,30	1,02	1,47	2,18	1,35	2,52
C'	A	0,12	0,05	0,45	0,27	0,22	0,43	0,13	0,32
C'	B	0,02	0,08	0,32	0,37	0,43	0,57	0,40	0,30
D,	C	—	—	—	—	—	—	0,05	0,05
Total		2,91	1,76	5,50	2,44	3,21	5,81	2,66	8,00
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 15

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, November*

		1	2	3	4	5	6	7	8
a	a	1,20	0,62	0,38	0,50	0,50	0,56	0,48	0,50
A	a	2,77	1,52	1,29	1,62	1,50	1,72	1,45	1,30
A	A	5,88	7,09	7,36	8,65	5,28	3,78	4,23	4,15
B	A	0,75	1,40	1,54	2,03	1,18	1,27	1,37	0,98
B	B	0,07	0,12	0,25	0,37	0,18	0,11	0,30	0,13
Total		10,67	10,75	10,82	13,17	8,64	7,44	7,83	7,06
a	b	0,17	0,07	—	0,05	0,13	0,22	0,03	0,43
a	a	0,42	0,12	0,23	0,28	0,40	0,51	0,38	0,55
A	b	0,05	—	—	—	0,05	0,18	0,02	0,30
A	a	7,60	5,11	4,85	4,18	5,17	6,60	5,18	7,50
A	A	4,92	4,32	2,28	4,55	4,95	4,59	5,07	3,95
B	a	0,32	0,32	0,50	0,15	0,33	0,69	0,43	0,62

B	A	5,50	8,67	9,90	7,18	9,50	8,87	10,27	8,05
B	B	0,12	0,32	0,54	0,23	0,35	0,11	0,35	0,37
C,	A	0,02	0,10	0,20	0,05	0,13	0,14	0,08	0,05
C,	B	0,05	0,15	0,29	0,12	0,17	0,11	0,07	0,07
Total		19,17	19,18	18,79	16,79	21,18	22,02	21,88	21,88
a	b	0,02	—	—	—	—	—	—	—
A	b	—	—	—	—	—	0,02	—	0,15
A	a	0,03	—	0,02	0,02	0,02	0,09	—	0,08
B	a	0,08	0,07	0,20	0,02	0,07	0,22	0,05	0,43
B	A	0,03	—	0,13	—	0,07	0,14	0,12	0,32
C,	A	—	—	0,04	—	0,02	0,07	0,12	0,08
Total		0,16	0,07	0,39	0,04	0,18	0,54	0,29	1,06
		30,0	30,0	30,0	30,0	30,0	30,0	30,0	30,0

Table 16

*The collective frequencies of the daily temperature extremities' threshold days according to two-dimensional codifying types during little, medium and great temperature oscillations, day, December*

		1	2	3	4	5	6	7	8
b	b	0,08	0,02	0,05	0,03	0,05	0,05	0,08	0,03
a	b	0,18	0,17	0,16	0,12	0,13	0,02	0,03	0,12
a	a	4,35	2,98	2,90	2,92	2,82	3,07	2,45	2,67
A	a	5,84	4,57	3,28	4,34	2,59	3,70	3,84	3,95
A	A	5,17	8,32	6,04	10,14	5,51	7,30	5,61	4,74
B	A	0,15	0,27	0,40	0,32	0,32	0,25	0,40	0,27
B	B	—	0,03	0,05	0,03	—	0,02	—	—
Total		15,77	16,36	12,88	17,90	11,42	14,41	12,41	11,78
b	c	0,07	—	—	—	0,02	0,09	0,02	0,13
b	b	0,05	0,03	0,04	0,07	0,07	0,07	0,05	0,02
a	c	0,03	—	0,04	—	0,02	0,02	—	0,10
a	b	1,80	1,00	0,97	0,83	1,43	2,04	1,47	2,28
a	a	1,97	1,25	1,18	1,60	1,62	1,45	1,31	1,82
A	b	0,03	0,03	0,09	0,03	0,08	0,09	0,08	0,35
A	a	7,45	7,10	7,50	4,92	8,45	8,20	7,51	8,65
A	A	2,52	2,82	4,35	4,15	4,85	2,07	4,98	3,30
B	a	0,13	0,15	0,23	—	0,12	0,11	0,08	0,15
B	A	1,05	2,20	3,50	1,45	2,85	2,27	3,02	2,20
B	B	—	—	—	—	0,03	—	—	—
Total		12,71	14,58	17,90	13,05	19,54	16,41	18,52	19,00
b	c	—	—	—	—	—	—	—	0,02
a	c	0,02	—	—	—	—	0,04	—	0,02
a	b	—	—	—	—	—	0,04	—	0,12
A	b	0,02	0,02	0,06	—	0,02	0,04	0,02	0,03
a	a	0,02	0,02	0,04	0,03	0,02	0,02	—	—
B	a	0,07	0,02	0,12	0,02	—	0,04	0,05	—
B	A	—	—	—	—	—	—	—	0,03
Total		0,13	0,06	0,22	0,05	0,04	0,18	0,07	0,22
		31,0	31,0	31,0	31,0	31,0	31,0	31,0	31,0

Table 17

*The monthly frequency of days, having little temperature oscillation, by stations*

	1	2	3	4	5	6	7	8
I	12,68	11,97	10,53	15,32	10,87	10,72	10,76	8,71
II	7,24	6,80	6,58	9,21	6,25	5,64	5,92	4,48
III	3,97	7,25	3,35	4,36	3,33	2,61	4,89	2,04
IV	1,86	1,80	1,92	2,16	1,46	1,72	1,43	0,92
V	1,15	1,72	2,66	1,32	1,13	1,04	0,81	0,42
VI	0,98	0,74	0,91	0,79	0,66	0,52	0,60	0,38
VII	0,75	0,78	0,66	0,63	0,58	0,57	0,57	0,22
VIII	1,04	0,55	0,86	0,70	0,53	0,57	0,40	0,42
IX	1,90	1,60	1,95	1,50	1,44	0,93	1,15	0,52
X	4,17	3,96	6,37	4,68	3,35	2,72	3,44	1,90
XI	10,67	10,75	10,82	13,17	8,64	7,44	7,83	7,06
XII	16,27	16,36	12,88	17,90	11,42	14,41	12,41	11,78
Year	62,68	64,26	59,49	71,74	49,66	48,89	50,21	38,85

Table 18

*The monthly frequency of days, having medium temperature oscillation, by stations*

	1	2	3	4	5	6	7	8
I	18,74	18,87	20,13	15,68	20,04	19,97	20,07	21,76
II	20,10	20,56	20,34	18,57	21,21	21,01	21,34	22,37
III	24,53	21,72	24,34	24,24	25,06	24,04	23,22	23,24
IV	22,79	25,36	23,18	24,26	24,72	22,40	24,38	19,96
V	23,75	26,74	22,84	24,62	26,13	22,62	25,82	18,01
VI	23,45	26,52	23,97	25,10	25,30	22,70	25,81	18,18
VII	23,62	26,63	23,62	25,50	25,09	19,62	25,15	16,93
VIII	22,93	26,31	22,06	24,00	23,42	18,53	25,20	16,93
IX	21,93	24,89	21,19	22,77	22,47	19,35	23,86	19,95
X	23,92	25,27	19,13	23,88	24,44	22,43	24,90	21,10
XI	19,27	19,18	18,79	16,79	21,18	22,02	21,88	21,88
XII	12,71	14,58	17,90	13,05	19,45	16,41	18,52	19,00
Year	257,74	276,63	257,49	258,46	278,60	251,10	280,15	239,31

Table 19

*The monthly frequency of days, having great temperature oscillation, by stations*

	1	2	3	4	5	6	7	8
I	0,09	0,16	0,34	—	0,09	0,31	0,17	0,53
II	0,66	0,64	1,08	0,22	0,54	1,35	0,74	1,15
III	2,88	2,05	3,32	2,40	2,61	4,35	2,89	5,72
IV	5,35	2,84	4,90	3,58	3,82	6,28	4,19	9,12
V	6,60	2,54	5,50	5,06	3,74	7,34	4,37	12,57
VI	5,57	2,74	5,12	4,11	4,04	6,82	3,59	11,44
VII	6,83	3,59	6,72	4,87	5,33	10,81	5,28	13,85
VIII	7,03	4,14	8,08	6,30	7,05	11,50	5,40	13,65
IX	6,37	3,51	6,86	5,73	6,09	9,72	4,99	9,53
X	2,91	1,76	5,50	2,44	3,21	5,81	2,66	8,00
XI	0,16	0,07	0,39	0,04	0,18	0,54	0,29	1,06
XII	0,13	0,06	0,22	0,05	0,04	0,18	0,07	0,22
Year	44,58	24,10	48,03	34,80	36,74	65,01	34,64	86,84



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